

Militarism and the Indo-Europeanizing of Europe



Robert Drews



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This book argues that the Indo-Europeanizing of Europe essentially began shortly before 1600 BC, when lands rich in natural resources were taken over by military forces from the Eurasian steppe and from southern Caucasia. First were the copper and silver mines (along with good harbors) in Greece, and the copper and gold mines of the Carpathian basin. By ca. 1500 BC other military men had taken over the amber coasts of Scandinavia and the metalworking district of the southern Alps. These military takeovers offer the most likely explanations for the origins of the Greek, Keltic, Germanic and Italic subgroups of the Indo-European language family.

Battlefield warfare and militarism, Robert Drews contends, were novelties ca. 1600 BC and were a consequence of the military employment of chariots. Current opinion is that militarism and battlefield warfare are as old as formal states, going back before 3000 BC.

Another current opinion is that the Indo-Europeanizing of Europe happened long before 1600 BC. The “Kurgan theory” of Marija Gimbutas and David Anthony dates it from late in the fifth to early in the third millennium BC and explains it as the result of horse-riding conquerors or raiders coming to Europe from the steppe. Colin Renfrew’s *Archaeology and Language* dates the Indo-Europeanizing of Europe to the seventh and sixth millennia BC, and explains it as a consequence of the spread of agriculture in a “wave of advance” from Anatolia through Europe. Pairing linguistic with archaeological evidence Drews concludes that in Greece and Italy, at least, no Indo-European language could have arrived before the second millennium BC.

Robert Drews studied ancient history—Near Eastern, Greek and Roman—at the Johns Hopkins University and received his degree in 1960. For the next 45 years he taught the full slate of ancient history at Vanderbilt University, and became interested especially in the evolution of religion and of warfare. In the latter field his publications include *Coming of the Greeks* (1988), *The End of the Bronze Age* (1993) and *Early Riders: The Beginnings of Mounted Warfare in Asia and Europe* (2004).



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First published 2017
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

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British Library Cataloging-in-Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

A catalog record for this book has been requested

ISBN: 978-1-138-28272-8 (hbk)

ISBN: 978-1-315-27055-5 (ebk)

Typeset in Times New Roman
by Florence Production Ltd, Stoodleigh, Devon, UK

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Acknowledgements

I expect that this book will interest military historians who deal with the ancient world, but it is addressed more directly to Indo-Europeanists, Assyriologists, Egyptologists, Hittitologists, Mycenologists and Archaeologists who work in widely separated lands. Because I am not expert in any of those disciplines I have relied heavily on what specialists have written, as the bibliography will show. Publications do not answer all questions, and many scholars with whom I exchanged e-mails have given me personal and timely help. Let me here thank Mikheil Abramishvili, Constantin Alamariu, David Anthony, Vassilis Aravantinos, Richard Beal, Nikolaus Boroffka, Anne Chapin, Michele Cupitò, Andrej Epimakhov, Andrew Garrett, Anthony Harding, Christian Horn, Maria Ivanova, Mario Küssner, Lene Melheim, Carola Metzner-Nebelsick, Barry Molloy, Martin O'Collins, Thomas Palaima, Mitchell Rothman, Karen Robinson, Hakob Simonyan, Adam Smith, Felix-Adrian Tencariu, Peter Tóth, Aleydis Van de Moortel and Michael Witzel. Especially helpful were the three anonymous readers who pointed out some of the errors and omissions in the original draft.

Thanks also to Jim Toplon and his Interlibrary Loan staff at the Vanderbilt library for their persistence and ingenuity in locating exotic publications. Securing suitable images for publication, along with permissions to publish them, is a frustrating business. For assistance there I am grateful to the persons mentioned in the captions, and also to Brigitte Badelt at the Franz Steiner Verlag, Lucretiu Birliba (*Studia Antiqua et Archaeologica*), Brian Collins (*Oxford Journal of Archaeology*), Rudolf Echt (*Saarbrücker Beiträge zur Altertumskunde*), Lone Klint Jakobsen at the National Museum of Denmark, Albrecht Jockenhövel (*Prähistorische Bronzefunde*) and Lyudmil Vagalinski (*Archaeologia Bulgarica*). And thanks to Millie Fullmer, Director of Visual Resources at Vanderbilt University, for scanning images from print.

Abbreviations

ABSA	Annual of the British School at Athens
AJA	American Journal of Archaeology
AR	Archaeological Reports
BAR	British Archaeological Reports
BASOR	Bulletin of the American Schools of Oriental Research
CANE	<i>Civilization of the Ancient Near East</i> (ed. Jack Sasson)
JAOS	Journal of the American Oriental Society
JCS	Journal of Cuneiform Studies
JHS	Journal of Hellenic Studies
JIES	Journal of Indo-European Studies
JNES	Journal of Near Eastern Studies
OEANE	<i>Oxford Encyclopedia of Archaeology in the Near East</i>
OJA	Oxford Journal of Archaeology
PBF	Prähistorische Bronzefunde
PNAS	Proceedings of the National Academy of Sciences
PPS	Proceedings of the Prehistoric Society
PZ	Prähistorische Zeitschrift

1 The origins and spread of Proto-Indo-European

This book will argue that the Indo-Europeanizing of Europe—except for its far northeast—began in the seventeenth and sixteenth centuries BC, with military take-overs of lands rich in natural resources. That is a topic quite distinct from questions about the origins and the early spread of Proto-Indo-European. Those questions do have a bearing on the present topic, however, and this chapter will therefore state my understanding of the origins of Proto-Indo-European in the fourth millennium BC and its remarkable spread during the third.

Indo-Europeanists are apparently quite certain that Proto-Indo-European, henceforth PIE, was still being spoken after the invention of the wheeled vehicle, which occurred ca. 3500 BC or perhaps a century or two later. The reason for the linguists' confidence is that the several branches of Indo-European inherited words for wagon, wheel, yoke, thill and axle.¹ Because the various branches also have a word for wool, they must have left the PIE stem at some time after sheep began to be bred for their wool. This too had occurred by the fourth millennium BC (sheep were raised thousands of years before that, but for their meat). After discussing wool, wheels and other items of diagnostic value, Benjamin Fortson dates "a breakup of PIE in the late fourth millennium. Linguists would not be comfortable with a date much later than this."²

The Indo-Hittite theory

Granted that PIE was spoken for some time between ca. 3500 and 3000 BC, what can be said about its origins, about the process and place of its evolution, and about its early spread? The progress made on these questions in the last few decades has been remarkable. Perhaps the most important development in research on the origins and spread of PIE we owe to Indo-Europeanists, who have determined that the Indo-Hittite theory—as an explanation of the profound differences between the Anatolian and the "other" Indo-European languages—is basically correct. The theory, still unfamiliar to many archaeologists and prehistorians, was first proposed by Emil Forrer in 1921, just 5 years after the decipherment of Hittite, and in 1938 was more fully formulated by Edgar Sturtevant.³ "Indo-Hittite" is the unfortunate name coined by Sturtevant, and many linguists prefer not to use it, but the substance of the theory has now been generally accepted. Sturtevant noted the

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very archaic features of Hittite, for example of the Hittite neuter nouns. And he saw that “even stronger evidence for the Indo-Hittite hypothesis is presented by innovations common to the Indo-European languages but foreign to Hittite.”⁴ A very early bifurcation of a language that, *faute de mieux*, we must call “Proto-Indo-Hittite,” eventually produced two language families. One of them was the Anatolian: this family consisted of Hittite (more correctly “the language of Kanesh”), Luwian and their cognate languages, all of which had disappeared by the end of antiquity. The other family was the Indo-European, which has spread over most of the earth.

The competing view, dominant until almost the end of the twentieth century, was that the Anatolian languages were just another branch of Indo-European and had—like the others—evolved from PIE. In this view, there were folk migrations of PIE speakers from the north into Anatolia: after arriving in Anatolia, the migrators were much influenced by the native languages, and so their speech soon lost many of its PIE features. The theory that Anatolian lost many of its PIE features, known among linguists as the *Schwundhypothese* (“loss-hypothesis”), is no longer tenable. The Anatolian languages are archaic, reflecting an evolutionary stage considerably *prior* to the stage reached in PIE.

The scholarly consensus on this point is recent. In 1994 Jaan Puhvel professed his opposition to the Indo-Hittite heresy and his abiding faith in the *Schwundhypothese*: “I have been an instinctive adherent throughout and do not anticipate any belated Pauline conversion.”⁵ More cautious was Craig Melchert. In his *Anatolian Historical Phonology*, also published in 1994, Melchert wrote, “I consider it an open question whether the non-Anatolian Indo-European languages underwent a period of common linguistic development after ‘separation’ of the Anatolian group.”⁶ By 2000 Melchert considered the question closed: “the crucial point is that there is now limited but compelling evidence that the rest of the Indo-European languages underwent a set of shared common innovations in which Anatolian did not share.”⁷ Alexander Lehrman also observed that when in 1994 he wrote his “Indo-Hittite Revisited” few linguists accepted the theory, but that by 2000 many had adopted it “either in name as well as in essence . . . or in essence if not in name.”⁸

Lehrman’s own work contributed to the success of the Indo-Hittite theory, but most important were the computational cladistics that a group of scholars at the University of Pennsylvania began to apply to the Indo-European language family in the middle 1990s. Borrowing from biologists’ use of the computer to establish phylogenetic trees, linguists Don Ringe and Ann Taylor and computer scientist Tandy Warnow concluded that in the original bifurcation of a proto-language one branch evolved after many centuries into Anatolian, and the other branch led eventually to all of the “other” Indo-European languages.⁹ This conclusion seems to be accepted by most Indo-European linguists.¹⁰ The plain consequence of all this, unwelcome as it may be, is that Hittite was not an Indo-European language: it was a distant relative of the Indo-European languages. What Bedrich Hrozný actually discovered is that Czech, French, English, and all the other Indo-European languages belong to something still larger: the Indo-Hittite language family.

Radical innovations evidently took place in what was to become the Indo-European branch of Indo-Hittite after it diverged from what was to become the Anatolian branch. In the Anatolian languages nouns for animate beings did not differentiate between masculine and feminine genders, and in PIE they did. PIE speakers had a subjunctive and optative mood for their verbs, but Anatolian speakers had neither. The PIE verb had a future tense and at least three past tenses (perfect, imperfect, aorist), while the Anatolian verb had only one past tense and no future tense.¹¹ The lexicons of the Anatolian languages, so far as they are known, were very different from that of PIE: in Hittite the word for daughter bears some resemblance to its parallel in PIE, but the words for son, father, mother, brother and sister do not. The innovations that produced PIE are so many and so significant that we must suppose that the bifurcation of Proto-Indo-Hittite occurred a very long time before the notional date—between 3500 and 3000 BC—of PIE. Although in the weakest version of the Indo-Hittite theory the time-frame is imagined as only a few centuries, it is more likely that we are dealing here with a few millennia.

The fading of folk migrations

Another advance in the study of the origins of PIE and the subsequent expansion of Indo-European languages is the gradual fading of belief in folk migrations, which for a long time were central in most discussions about the spread of the Indo-European languages. Folk migrations have largely been discredited by historians and archaeologists. Although linguists have been slower to discard the idea of folk migrations of Indo-European speakers, they may now be ready to do so.¹²

Movements of individuals, families or large groups of families occurred regularly in antiquity, as they do today, and over the course of several generations a continuing pattern of emigration and immigration could bring about significant changes in a region's population and in the language or languages spoken there. The Amorite infiltration into Mesopotamia in the early second millennium BC is a case in point, as is the Libyan expansion into Egypt's western Delta a millennium later and the Gallic intrusion into northern Italy at about the same time. From the seventh to the fifth millennium BC, as we shall presently see, Indo-Hittite languages were brought to many places where they had previously not been heard, and in the third millennium BC something similar seems to have happened with the expansion of Indo-European languages along the grassland and forest steppe.

Expansions of the sort mentioned above, however, are quite different from the folk migration that was for a long time imagined by philologists, archaeologists and historians. In the latter a *Volk*—an entire nation—simultaneously picks up its belongings and moves from one land to another, leaving none of its members behind. Because Indo-European studies grew up in the heyday of nationalism it is not surprising that nineteenth-century philologists assumed that there had once been an “Aryan nation,” which gave birth to a constellation of daughter nations that corresponded to the linguistic subgroups that the philologists had identified: Greek, Indo-Iranian, Italic, Germanic, Keltic, Slavic and Baltic. It was assumed

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that these “peoples” originally lived in or close to the *Urheimat*, wherever that may have been, and that eventually each of them made a very long trek—a *Volkswanderung*—from its original home to the land where the subgroup was located in historical times. Belief in prehistoric folk migrations was supported by the ancient accounts of actual migrations: of the Cimbri and Teutons expelled from their homeland by an encroachment of the sea in the second century BC, or of the Visigoths and other Germanic coalitions fleeing from the Huns 500 years later. In addition to these historical migrations were fanciful stories about national migrations, all very familiar to Europeans in the nineteenth century. Herodotus told several such stories, but more influential was the biblical story of two million Israelites making their 40-year journey from Egypt to Canaan. In the nineteenth and early twentieth century, then, the imagined *Volkswanderung* featured a nation moving solidly together over a considerable distance before finally and violently seizing a new land in which to live.

Early archaeologists were keen to find evidence for migrations in prehistory. Destruction of settlements, and even a change in the material assemblage, was interpreted to mean that a folk migration had occurred. Linguists accepted the identification of “new pots” with “new peoples,” and so explained the replacement of one language by another. As Colin Renfrew remarked in *Archaeology and Language*, “Sometimes, when reading the earlier literature, you would think that every time the style of pottery in use in a village changed, the transition must have been accompanied by a total change of population, and with it of language.” But the literature has changed, Renfrew continued, and “one of the most striking shifts in archaeological thought in the past few years has been the realization that there have been far fewer wholesale migrations of people than had once been thought.”¹³ The prehistory of Britain was once seen as a long series of invasions from the continent, but in 1966 Grahame Clark argued that from the beginning of the Neolithic period to the Roman conquest only once had Britain been overrun by continentals (who brought their Bell Beakers with them). Even a folk migration to Britain by a Bell Beaker people, Renfrew observed, “would today be discounted by most scholars.”¹⁴

Belief in prehistoric folk migrations, which should always have been suspect, began to decline with historians’ recognition that—with a very few exceptions—nations, or *Völker*, in antiquity were nothing more robust than language communities. As language communities, they were indeed “as old as history,” as Walter Bagehot described them, but nationalism and national solidarity certainly were not: nations as agents in history were not of much importance until the eighteenth century. This perception began with Marxists, who protested against nationalism for ideological reasons. Serious study of nationalism was launched in the 1930s and 1940s, and 40 years later it culminated in books by Ernest Gellner, Benedict Anderson and Eric Hobsbawm. Migrationism was also undermined by a closer study of the artifacts. Archaeologists found that many of what were initially regarded as breaks in the material record could be better explained, on more careful analysis, as evolutions from one technique or one style to another. By the 1960s archaeologists were sloughing off their belief in prehistoric *Völkerwanderungen*,

and the “New Archaeology” was looking not for signs of migration and displacement but for evidence of the evolution *in situ* of material cultures. Radiocarbon dating also tended to weaken the belief in migrations, the resultant dates often conflicting with the supposed dates of a migration.

The folk migration model was also undone by common sense, as in a manifesto from Oliver Dickinson:

I will state flatly that I find it extremely implausible that, once established, basically agricultural communities—such as almost all the prehistoric peoples of Europe and nearer Asia were from the Neolithic period onwards—were as ready as this model requires to uproot themselves and leave the land that represented their economic capital, held the burials of their dead, and had other cultural and religious associations for them. I am particularly reluctant to envisage this for periods when the vast majority of any community would have had no faster means of travel than their own feet.¹⁵

For these and other reasons, *Völkerwanderungen* are no longer so likely as formerly they were to cloud discussions about the spread or dispersal of the Indo-European languages.

The homeland of the Proto-Indo-Hittite language

No less important than the vindication of the Indo-Hittite theory and the fading of the *Volkswanderung* is the growing evidence that the Anatolian language family was indigenous to south-central and western Anatolia. This was proposed, although less clearly than it could have been, in Colin Renfrew’s *Archaeology and Language*,¹⁶ and it has been supported by subsequent research. It nevertheless is still resisted by many linguists and possibly even by most. In his chapter, “The Position of Anatolian,” soon to be published in *Handbook of Indo-European Studies*, Melchert writes “I follow here the long-standing majority view that the Indo-European languages of Anatolia are intrusive to Asia Minor, having moved there from some point further north in Europe.”¹⁷ Melchert concedes, nevertheless, that the supposed folk migration into Anatolia could not have occurred late in the third millennium BC, as many linguists once assumed:

Contrary to earlier views, there has now developed a consensus among linguists that entry of Indo-European speakers into Asia Minor was much earlier than previously assumed. . . . The gist of the argument is that the attested degree of differentiation of the IE Anatolian languages such as Luvian and Hittite already by the beginning of the second millennium requires at a minimum that their divergence from Proto-Anatolian began by the middle of the third millennium. It may easily have begun as early as the end of the fourth.¹⁸

Whether or not linguists have reached a consensus on this point, there could have been no migration of Indo-European speakers (or, let us say, of Indo-Hittite

speakers) into Anatolia either ca. 2500 BC or ca. 3000 BC. Because the Anatolian languages did not share with PIE the terms for a wheeled vehicle and its constituents we must conclude that Proto-Anatolian and PIE had gone their separate ways by the time, say 3300 BC, that wheeled vehicles were invented.¹⁹ Moreover, because by the time that wheeled vehicles made their appearance PIE had already developed its distinctive lexicon, its feminine gender and its elaborate verb system, we must say that the separation of PIE and Proto-Anatolian had occurred a very long time before 3300 BC. The split between the Indo-European and the Anatolian branches of Indo-Hittite could hardly have occurred any later than 4000 BC and is more likely to have occurred by 5000 BC. That the Anatolian branch of Indo-Hittite left a homeland in the north and migrated to Anatolia either ca. 4000 BC or ca. 5000 BC is scarcely credible. Not only does the idea require the widely discredited *Volkswanderung*, but it also conflicts with what archaeologists have learned about Anatolian prehistory and the spread of a Neolithic economy.

Neolithic Anatolia was far from underpopulated. Quite to the contrary, when we compare it to Europe and the Eurasian steppe we would have to say that its Neolithic population was remarkably dense. Some of the earliest settlements anywhere—whether in China, the Near East, or Sudan and Egypt—have been found in eastern Anatolia. These settlements probably arose for the knapping of obsidian (before metallurgy, obsidian was the most prized material for the making of cutting tools and weapons) rather than for the production of food. Most important of the sites is a village at Hallan Çemi, half way between Diyarbakır and Lake Van and overlooking the Batman river, a tributary to the upper Tigris. The settlement at Hallan Çemi has been dated ca. 10,000 BC, and the villagers may have produced at least a small portion of their food (the excavators concluded that the villagers kept domesticated pigs).²⁰ More certain than the pigs of Hallan Çemi is the obsidian found at the site. The excavators found that obsidian was brought there “from both the Van and Bingöl areas and used extensively in all parts of the site.”²¹ Down the Batman river from Hallan Çemi were two other settlements (Demirköy and Körtik), which may represent relocations of the same community. Other very early settlements stood along the upper Euphrates and its tributaries.

In the ninth millennium BC Neolithic settlements began appearing on the plateau of central Anatolia. Possibly these were preceded by settlements in Cyprus, where several sites dating to the ninth millennium BC have been found.²² The earliest known settlement in the Konya plain of Anatolia, where the annual precipitation is rarely more than 300 mm (12 inches), was found under a small mound at Pınarbaşı. Carbon dates indicate that the Pınarbaşı settlement lasted from ca. 8500 to 8000 BC. The occupants of this village too were engaged in the knapping of obsidian, and for their meat they depended on game animals.²³ In the Aceramic and Early Neolithic periods the Konya plain had settlements large and small. In the seventh millennium BC one of the largest settlements, evidently because of the obsidian that could be collected on the slopes of Hasan Dağ and knapped for exchange, was the proto-city at Çatal Höyük, with a population of at least 5000. More typical would have been villages like Hacilar, far to the west, with at most a few hundred people. Mihriban Özbaşaran’s survey of the ninth to the sixth

millennium BC on the plateau lists dozens of identified Neolithic sites, at eleven of which there has been some excavation.²⁴

Neolithic sites on the plateau were relatively conspicuous to archaeologists, while sites along the Aegean and Marmara coasts have been difficult to detect because they are under alluvial deposits. Recent discoveries and excavations, however, have shown that on Anatolia's Aegean coast, which receives twice as much precipitation as does the plateau, the Neolithic way of life began ca. 7000 BC and here the villagers were most definitely food-producers. A line of settlements has been found here, from Çukuriçi Höyük near Ephesus to the Troad. Most productive has been the site of Ulucak Höyük, near Izmir, where Turkish archaeologists have been working since 1995. From the 22,000 bones recovered at the site it is clear that from the very beginning ca. 7000 BC animal husbandry—of sheep, goats, pigs and cattle—was a mainstay for the Ulucak villagers. In the lowest level (Level VI) all four domesticates are represented.²⁵

Further north, inland from the Sea of Marmara and the Bosphorus, were many more settlements, most of them sharing in the culture of the type-site, Fikirtepe. According to Mehmet Özdoğan, recent research has “securely solved the chronological position of the Fikirtepe culture, placing it between 6450 and 6100 cal BC.”²⁶ Like their contemporaries to the south, the Fikirtepe villagers depended for their meat on domesticated ovicaprids, pigs and cattle.

The spread of stock-raising and agriculture was gradual. Unlike the massive folk migrations visualized 100 years ago, the continuous “wave of advance” proposed by Renfrew brought a trickle of Neolithic settlers—a few at a time—further and further into arable land. From the western coast of Anatolia colonists carried their animals and their crop seeds westward and northward. All of this movement was obviously seaborne. The fertile and well-watered plain of central Crete, between Mts. Dikte and Ida, was one of the first places to be colonized: Level X at Knossos has often been dated as early as 7000 BC, but some specialists would date it ca. 6600 BC. The colonization was probably carried out by fewer than 100 people. These pioneers, as Cyprian Broodbank and Thomas Strasser showed in a careful but imaginative study, knew very well where they were going and how to get there, and they brought with them across the sea no pottery but all four domestic animals: sheep, goats, cattle and pigs.²⁷ Broodbank and Strasser imagined a flotilla of ten or fifteen paddled hide boats or log boats, each carrying a ton or two of cargo.²⁸

The same kind of colonizing brought the Neolithic to Europe (“Europe” in this book is the Eurasian continent west of the Bosphorus, the eastern arc of the Carpathian mountains, and the Gulf of Finland). First to beckon was the Thessalian plain. Lying in the lee of the Pindus mountains, and to the south of Mt. Olympos, the Thessalian plain was the broadest expanse of arable land across the sea from Anatolia. Argissa on Thessaly's Peneios river was apparently colonized somewhat later than central Crete, after the making of pottery had begun, and the settlers again brought with them on their boats the full roster of domesticates.²⁹ Other villages along the Peneios—Soufli Magoula downstream and Platia Magoula Zarkou upstream from Argissa, plus a cluster of other sites—attest to a

considerable influx into Thessaly during the Early Neolithic period.³⁰ Sesklo, away from the Peneios but a short walk inland from the Gulf of Pagasai, became a town of several hundred people by the end of the seventh millennium BC.³¹ Settlements on the coast of Macedonia and Thrace were planted at Nea Nikomedeia and Hoca Çeşme, the latter just east of the mouth of the Maritsa/Evros river, which today forms the border between Turkey and Greece.

From the coast, settlers made their way—evidently in the “wave of advance” posited by Renfrew—up the rivers of Thrace: the Maritsa/Evros, the Mesta, and especially the Struma (Strymon). Along the middle of the Struma valley six Early Neolithic village sites have been located, and at one of them—Ilindentsi—excavation has begun under the direction of Dr. Malgorzata Grebska-Kulova.³² Earlier excavations, by a French-Bulgarian team, unearthed an informative Early Neolithic site at Kovachevo, in south-central Bulgaria. Judging from what they have found at these sites, archaeologists believe that the original settlers, usually a small group of twenty or thirty families, came from western Anatolia.³³ From these small Early Neolithic settlements grew the Karanovo-Gumelnitsa culture, which in the fifth millennium BC covered much of Bulgaria and southeastern Romania and may have included several hundred thousand people. Although many of these people would have been descendants of immigrants from Anatolia, just as many may have been descended from the Paleolithic hunter-gatherers of southeastern Europe. The security provided by food production must have attracted many hunter-gatherers to the Neolithic way of life. In any case, on the basis of changes in the material culture Özdoğan concluded that for centuries the settlements in southeastern Europe kept in touch with their Anatolian roots.³⁴

The wave of advance that brought agriculture and stock-raising to the Balkans seems to have continued into eastern Romania, Moldova and western Ukraine. The Cucuteni-Trypillian (or Tripolye) culture of this region commenced soon after 5000 BC, and is now known from several hundred sites. These were primarily located in the river valleys, since the steppe itself was not easily cultivated. Eventually the Cucuteni-Trypillian culture reached as far to the east as the right bank of the Dnieper.

The flow of Neolithic colonists from northwestern Anatolia into southeastern Europe and western Ukraine has been the topic of much archaeological discussion and literature in the last 15 years. It was the subject of workshops held in Istanbul in May of 2004 and in April of 2009. The proceedings of both workshops have been published.³⁵ In 2011 Mehmet Özdoğan, who has directed many of the pertinent excavations, provided a useful survey: “Archaeological Evidence on the Westward Expansion of Farming Communities from Eastern Anatolia to the Aegean and the Balkans.” Özdoğan’s article appeared in *Current Anthropology* in 2011, in a supplemental fascicle titled, “The Origins of Agriculture: New Data, New Ideas.” Another survey published that same year in *Praehistorische Zeitschrift* traced the expansion of the Neolithic from the Anatolian plateau to southeastern Europe: between 6500 and 6000 BC successive periods of colonization brought three different “Neolithic packages” from western Anatolia to Greece and the Balkans.³⁶

In short, archaeologists have found plenty of evidence that there was—as Renfrew argued a generation ago—a sustained outflowing from western Anatolia into southeastern Europe in the Neolithic period. For a folk migration in the opposite direction—from southeastern Europe or the Pontic steppe into Anatolia—we have never had any evidence at all, nor do we have reason to suspect that in Neolithic or Chalcolithic times any such thing was attempted or even contemplated. The colonizing from Anatolia to central Crete, to Thessaly, to the river valleys of Thrace and ultimately to the lands along the lower Danube, made very good sense: the places toward which the colonists—100 or so at a time—sailed were at least as fertile as the places from which they came, and either were populated only by hunters and gatherers or (as was the case with Crete) were completely vacant. Why an entire linguistic community (thousands? tens of thousands?) would have considered moving from well-watered southeastern Europe to the Anatolian plateau, which already had as large a population as its arid climate could support, is difficult to imagine. Crossing the Bosphorus or the Dardanelles, against the native population's opposition, would itself have been a daunting challenge. Even more difficult to imagine is where on the steppe or in the Balkans a large and cohesive linguistic community (thousands? tens of thousands?) would have come from. Perhaps it is superfluous to add that had there been a migration from the Balkans into Anatolia in the fifth millennium BC, the language brought into Anatolia would have been descended from the very language brought out from Anatolia a millennium or two earlier.

If we pair the Anatolian colonization of southeastern Europe with the Indo-Hittite theory, which in 1987 Renfrew did not do, questions about the origins of Proto-Indo-European are put into a very different light. The languages brought to Europe would not have been (or would not have become) Indo-European, but would have been Indo-Hittite and would have become cognates to the Anatolian languages. As Margalit Finkelberg has well argued, one of the languages of southeastern Europe descended from Indo-Hittite was very likely the “Minoan” language of the Linear A tablets found on Crete. Another, as Finkelberg has tentatively suggested, may have been Etruscan.³⁷

All of that would depend, of course, on the premise that the Anatolian language family—and therefore Indo-Hittite also—was native to western Anatolia. Let us return to that premise and examine it. Not every language native to Neolithic and Bronze Age Anatolia belonged to the Anatolian language family. The ancestor of the Hurrian language attested in the Bronze Age may have been spoken in parts of eastern Anatolia during the Neolithic period. More certainly, Hattic was the language of Hatti, the land within the loop of the Kızılırmak (“Red river,” known to the Greeks as the Halys river) and south of the Pontic mountain range, and Hattic did not belong to the Anatolian family nor—like Hurrian—can it be easily assigned to any other known language family. During the four and a half centuries of the Great Kingdom centered at Hattusha the Hattic language gradually gave way to the language of Kanesh, but Hattic continued to be used on religious and ceremonial occasions. Scraps of Hattic were therefore inscribed on the Hittite tablets found at Boğazkale (ancient Hattusha), providing cuneiform scholars with what little is known about Hattic.

South and west of the Kızılırmak, however, until late in the Bronze Age people seem to have spoken one or another of the Anatolian languages. Of these Luwian was far and away the most widespread, followed by Palaic and finally—and perhaps only in the large city of Kanesh until the language was exported to Hattusha in the Late Bronze Age—by “Hittite.” The number of Luwian speakers can only be guessed, but as one can see by glancing at map B II 13 in the *Tübinger Atlas des Vorderen Orients*, archaeologists have located hundreds of Early Bronze Age settlements in western Turkey, and they are thickest in the triangle between Konya, Burdur and Eskişehir.

In the Iron Age Luwian, Palaic, Hittite and perhaps other early Anatolian languages evolved into a variety of regional vernaculars. Thanks to the work of John Ray, Ignacio-Javier Adiego and other specialists, and to the 1996 discovery of a Carian-Greek bilingual inscription at Kaunos, it has now become quite clear that Carian belonged to the Anatolian language family.³⁸ We must therefore now say that all the known Iron Age languages of southwest Anatolia—Carian, Lydian, Lycian, Sidetic and Pisidian—were descended either from Luwian or from a cognate Anatolian language of the Bronze Age. In fact, until Phrygian and Greek were imported, in all of western and southern Anatolia no language other than those belonging to the Anatolian family is attested.³⁹ That blanket statement agrees with Onofrio Carruba’s study of the place-names in Anatolia. Carruba found that southwest of a diagonal drawn from the Sea of Marmara to the Gulf of Iskenderun none of the attested place-names can be assigned to any language other than those of the Anatolian language family.⁴⁰ Place-names ending in *-ss*, *-nd* or *-nth* were common southwest of the diagonal, as they were in Crete, Greece and the southern Balkans. Theories about a migration of Proto-Anatolian or Proto-Indo-Hittite speakers from southeastern Europe or the Pontic steppe into western and southern Anatolia would necessarily need to assume an event both catastrophic and undetectable: although leaving no archaeological trace, the migration would have completely obliterated whatever languages had earlier been spoken there and whatever place-names had earlier been in use.

We have, in short, neither linguistic nor archaeological evidence—and no sound reason to think—that the Anatolian languages of western and southern Anatolia had ever been superimposed on a non-Anatolian or pre-Anatolian substrate. For more than 100 years the prehistory of Eurasia has been distorted by illusions of *Völkerwanderungen* into Anatolia of Hittite and Luwian nations or of a mass of Proto-Anatolian speakers. That prehistory must finally be set straight. The roots of the Anatolian languages *in situ* go back at least to the beginning of the Neolithic period, when settled communities were first established. The Indo-Hittite language family originated in southern and western Anatolia.

The origins of PIE

Although the argument continues to be made that PIE was spoken in southern and western Anatolia in the eighth or seventh millennium BC,⁴¹ the argument confuses the Indo-Hittite theory and its terminology. If we agree that the “Hittite” side of

the family evolved in southern and western Anatolia, then we must suppose that the Indo-European side of the family evolved somewhere else. And if we agree that the language spoken in Anatolia in the eighth or seventh millennium BC was Proto-Indo-Hittite, then we can be certain that a long time (not several centuries, but several millennia) elapsed before the maturation of PIE.

From the certain and the near-certain we must venture into the uncertain but probable. A wave of advance cannot account for the evolution from Proto-Indo-Hittite to PIE. Here we need not a gradual extension, a day's walk or a day's sail at a time, but a clean break: a hiving-off or colonization to a distant land, resulting in a considerable geographical separation from the originating population. An oversea colonization, probably before the end of the sixth millennium BC, must have established settlements of Indo-Hittite speakers far from western Anatolia and the Balkans, and the colonists or their offspring must have proceeded inland to a place still farther away: far enough away, that is, that the settlers were no longer connected to lands already inhabited by Indo-Hittite speakers. In their new home the colonists would instead have been in close contact with the local hunter-gatherers. Interaction between the Neolithic settlers and the native hunter-gatherers would have led to far-reaching innovations in the Indo-Hittite that the settlers brought with them, and so to the evolution of PIE. This borrows from Marek Zvelebil's "creolization hypothesis," except that Zvelebil speculated that creolization accounted for the divergence of the several subgroups of PIE,⁴² and here the speculation is that PIE was itself a creole language: contact-induced language change, that is, was a very important factor in the substantial divergence of PIE from its Indo-Hittite roots. Surely Proto-Indo-Hittite colonists, when they reached an arable land far from their point of departure, must have mixed intensively with the Mesolithic inhabitants of the place.

That such a place was northern or central Europe is very unlikely. A hundred years ago, mostly for racial reasons, northern Europe was widely considered to have been the homeland of the Proto-Indo-Europeans. A similar scenario, although on different grounds, has been advocated since the early 1980s by Alexander Häusler, who believes that PIE was spoken over most of northern, central and eastern Europe. More specifically, the Baltic, Celtic and Germanic branches of the Indo-European language family were rooted, according to Häusler, in the Funnel-beaker culture (Trichterbecherkultur, or TBK, in German, and often TRB Culture in English). This was an Early Neolithic culture, which in the fourth millennium BC stretched from the Netherlands to the Baltic and south to the headwaters of the Elbe.⁴³

A northern European homeland for PIE can hardly be squared with the Indo-Hittite theory, and with the near-certainty that western Anatolia was the original locus of Proto-Indo-Hittite. How, ca. 6000 or 5000 BC, could Proto-Indo-Hittite speakers have hived off from Anatolia to northern Europe, and why would they have chosen to do so when there were equally fertile lands much closer to home? The required isolation from the world of Indo-Hittite speakers is difficult to imagine in Europe, where a wave of advance should have created an Indo-Hittite continuum from the Bosphorus and the Dardanelles to whatever point the wave had reached on the ground.

Since the 1940s the argument in favor of northern Europe as the PIE homeland has rested largely on its river names, which Hans Krahe concluded were Indo-European.⁴⁴ Wolfgang Schmid, extending the argument, proposed that PIE was spoken north of the Pripet marshes in Belarus, and that from this area Indo-European river names were brought into northern and central Europe and especially to the Baltic.⁴⁵ There is reason to believe, as will be detailed toward the end of this chapter, that by the middle of the third millennium BC many people in northeastern Europe were speaking an Indo-European language. But we shall also see, thanks to recent DNA studies, that these languages would have been intrusive rather than indigenous, having been brought into northeastern Europe by pastoralists from the east. These pastoralists were apparently the first food-producers to live along the Baltic, and it is possible that the river names in northeastern Europe were indeed conferred by Indo-European speakers. The language they would have been speaking, however, was not PIE but a slightly later stage of the language: Proto-Baltic. Instead of supposing that PIE was indigenous to northern Europe, we must say that in the third millennium BC an early descendant of PIE seems to have been brought into northeastern Europe. The PIE homeland, several centuries earlier, had apparently lain somewhere other than in Baltic Eurasia.

Leaving northern Europe, let us look at places more likely to have occasioned a clean separation of Neolithic colonies from an Indo-Hittite matrix. Almost inevitably we are led to suppose that the Black Sea was a factor in this separation. An important unknown here is the “Black Sea Flood,” which oceanographers William Ryan and Walter Pitman believed was a cataclysmic event ca. 5600 BC. As concluded by Ryan and Pitman, the Bosphorus was broken through at that time and the waters of the Mediterranean poured northward, in several months doubling the extent of the Black Sea and bringing it more or less to its present shape and size.⁴⁶ If such a flood did occur it would have inundated whatever Neolithic settlements were standing near the shores of the “old” Black Sea and would have provided the necessary separation of Indo-Hittite colonies from their mother country, but many geologists and oceanographers have disputed Ryan and Pitman’s conclusions.⁴⁷ Some of the critics accept the occurrence of a flood but believe it was not nearly so catastrophic as Ryan and Pitman contended that it was, and other critics have argued that the supposed flood did not occur at all.

“Black Sea Flood” or not, the Black Sea coast of Anatolia must be ruled out as the place where PIE evolved. In sharp contrast to southern and western Anatolia, where so many Neolithic settlements have been found, northern Anatolia is a blank. Roger Matthews noted the copious information about the Anatolian Neolithic that has come from the Konya plain and elsewhere in the south and west. “If on a map we draw a line across Anatolia from Istanbul to Malatya, however, we see that to the north of that line there is still no convincing evidence for a definite Neolithic presence in Anatolia.”⁴⁸ Although this may in part be a result of the fact that northern Anatolia is, in Matthews’ word, “understudied” by archaeologists, it is also a result of ancient demographic patterns. Matthews and his colleagues spent 5 years on “Project Paphlagonia,” funded by the British Institute at Ankara. The

archaeologists recorded evidence for an ancient presence at 336 sites in the Çankırı and Karabük provinces of Turkey. Most of the evidence dated from the Hellenistic and Roman periods, but twenty-six of the sites showed a presence in the Early Bronze Age.⁴⁹ Before 3000 BC the region seems to have been inhabited mostly by hunters and gatherers. Project Paphlagonia found not a single Neolithic (10,000 to 6000 BC) site and only six Chalcolithic (6000–3000 BC) sites, all from the middle or later phases of that period.

Unlike the southern shore of the Black Sea, the northern shore obviously attracted Neolithic settlers. The location of the settlements shows that the colonization must have come by sea. That the settlers came from the west is suggested by their fit within the Cucuteni-Trypillian archaeological culture, which proceeded into the steppe from the eastern foothills of the Carpathian mountains. The steppe itself was not very appealing: rarely receiving more than 300 mm of precipitation a year, the grass was deeply rooted and the sod too tough to hoe (oxen were not yet draft animals in the sixth and fifth millennia BC). The river valleys were more welcoming, offering limited agriculture as well as grazing for domestic animals, some trees, and of course plenty of fish. Neolithic settlers accordingly made their way up the valleys of the Dniester, Southern Buh (or Bug) and the Dnieper. In the Dniester and the Southern Buh the Neolithic material remains are characteristic of the Cucuteni-Trypillian culture. The material record from the Dnieper valley includes pottery very similar to that of the Cucuteni-Trypillian culture but has conventionally been assigned to the Sredny Stog culture, named for an island in the river some 150 miles upstream from the Black Sea. Dereivka is the most informative of the Sredny Stog sites.

River valleys beyond the Dnieper were much more difficult to reach from the Bosphorus and the Balkans. For boats sailing eastward along the north shore of the Black Sea the Crimean peninsula was a major obstacle. The peninsula itself was mostly grassland steppe (the earliest evidence for food production there dates to the middle of the fourth millennium BC),⁵⁰ with mountain ranges along the southeastern coast, and circumnavigation was long and arduous. But there is good reason to think that colonists did round the Crimea and proceed eastward.

One destination that could be considered, if we bypass the Kerch Strait and the Sea of Azov and sail to the eastern shore of the Black Sea, is southern Caucasia. Thomas Gamkrelidze and Vyacheslav Ivanov made a detailed argument that it was in the Kura and Araxes valleys during the Neolithic period that PIE evolved (their argument depended in part on correspondences between PIE and both Proto-Kartvelian and Proto-Semitic).⁵¹ Although 30 years ago I was persuaded that south Caucasia was the PIE *Urheimat*,⁵² I no longer am. Because terms for wheels and wagons were inherited from PIE by all branches of the Indo-European language family, linguists since early in the nineteenth century have recognized that wheeled vehicles must have been important to the PIE speakers. In the last 30 years evidence has continued to emerge for the very early presence and prominence of wheeled vehicles in northern Caucasia, but the same has not been true for southern Caucasia.⁵³

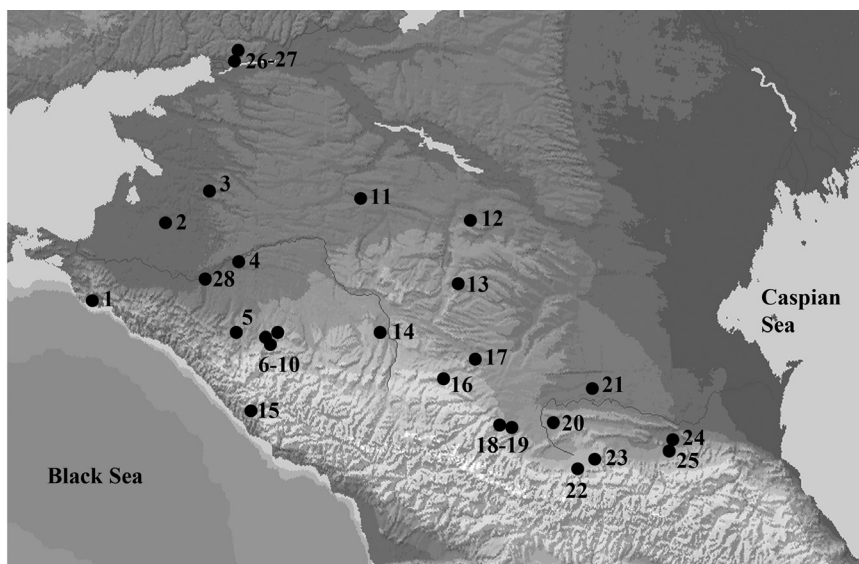
The Sea of Azov, the Khvalynsk culture and the Maikop culture

Although southern Caucasia may have some claim to have been the PIE homeland, northern Caucasia and the steppe north along the Don and the Volga have a better one.⁵⁴ This area in the fourth millennium BC had antecedents distant in both time and place. Late in the seventh or early in the sixth millennium BC Neolithic colonists seem to have made their way along the shore of the Black Sea, through the Kerch Strait to the Sea of Azov and the rivers that flow into it: especially the Kalmius, the Don and the Kuban. The land along the Kalmius and Don was inhabited by foragers and hunters, who preyed especially upon the wild horses that roamed the grassland steppe. The Mesolithic population is best known from burials associated with the Dnieper-Donets culture. Although they did not produce their own food, the hunter-gatherers did make pottery and usually decorated it with a comb.⁵⁵

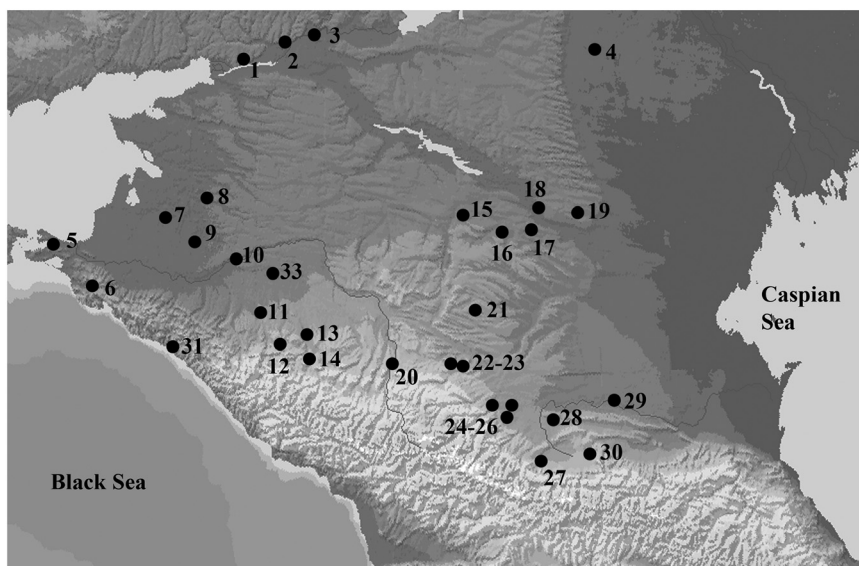
At some point in the seventh millennium BC the first Neolithic settlements in the area were planted, just to the west of the Don estuary on the Sea of Azov. The Neolithic settlers, who must have come by sea, brought with them the four domesticates familiar in western Anatolia and the Balkans: cattle, sheep, goats and pigs.⁵⁶ Although it is not certain where the colonists came from, the available evidence ties the Chalcolithic cultures of the northeastern Black Sea to the settlements along the rivers that empty into the northwestern shore of the Black Sea. According to Mariya Ivanova, the earliest settlements in northern Caucasia were “a distant extension of the Copper Age culture of southeastern Europe.”⁵⁷ If that is correct, I would assume that the colonists from the east brought with them an Indo-Hittite language.

The newcomers were apparently accepted by the locals, and for over three millennia the Neolithic and the indigenous populations seem to have lived side-by-side. Calibration of carbon dates indicates that several Neolithic cemeteries on the lower Don and its estuary, the most important one at Mariupol, were in use at least as early as 6000 BC.⁵⁸ From the Sea of Azov the Neolithic economy moved up the Don and especially up the Volga, which at its Volgograd bend lies less than 100 km east of the Don. Along the middle Volga the Khvalynsk archaeological culture began ca. 5000 BC, and it continued all through the fifth millennium BC.⁵⁹ Many small cemeteries from this culture have been found, but most information comes from a large cemetery (with more than 200 graves) excavated at Khvalynsk, a city on the right bank of the middle Volga some 500 km upstream from the Volgograd bend. For their meat the people in the Volga villages depended on the usual domestic animals, but also on the horse, which was so well adapted to the grassland steppe. Bones of cattle, sheep, goats and horses found in the graves indicate that these animals were regularly sacrificed at funerals. The bones at Khvalynsk are probably, as Anthony noted, the earliest evidence we have for horse domestication.

By the middle of the fifth millennium BC Chalcolithic settlers had also filtered up the Kuban river into northern Caucasia.⁶⁰ Here the annual precipitation was



Map 1



Map 2

Figure 1.1 The pre-Maikop (Map 1) and Maikop (Map 2) culture sites. Maikop itself is number 11 on the lower map. From Ivanova 2007, p. 31. Courtesy Maria Ivanova and Aramazd: Armenian Journal of Near Eastern Studies

much greater than on the steppe. The soil in northern Caucasia is rich, and in the western and central region agriculture was very productive. In the central upland area of north Caucasia oak and beech trees were once common. The eastern stretches of north Caucasia are more arid, verging toward desert. It is in the Kuban drainage region that the great Maikop kurgan stands, the Bronze Age kurgan whose rich grave goods (discovered in 1897) give the Maikop culture its name.⁶¹

The Maikop culture was once dated late in the third millennium BC but is now dated a millennium earlier. A “pre-Maikop” culture in north Caucasia, belonging to the Neolithic period, was likewise once placed no earlier than the fourth millennium BC, but Maria Ivanova’s analysis concludes that it began in the middle of the fifth.⁶² Basing her conclusions on carbon dates, Ivanova dates the Maikop culture from ca. 3500 to ca. 3000 BC, and the pre-Maikop culture to the late fifth and early fourth millennium BC.

With the advent of metallurgy the Kuban settlements began to play a pivotal role. The steppe had no copper, and the people in its valleys would have had to acquire copper either from the Ural mountains far to the east, or from the Caucasus. It is not yet known when metal began to be extracted from the northern Caucasus. Most specialists have assumed that the Maikop culture depended on the Kura-Araxes for its metal. In his survey of early Caucasian metallurgy, however, Antoine Courcier challenges the assumption and observes that—in addition to gold and silver—the northern Caucasus mountains have fifty-seven deposits of copper ore, in several of which arsenic is associated with copper.⁶³

Toward the middle of the fourth millennium BC the availability of arsenical bronze saws made possible the fashioning of wooden wheels and so of wheeled vehicles. Where first this happened is uncertain: wheeled vehicles are attested almost simultaneously as far apart as southern Mesopotamia and northern Europe.⁶⁴ What is certain is that the people who made the most of the invention lived north of the Caucasus, in the Kuban drainage area. They had access to arsenical bronze, to plenty of hardwood, and to oxen that were accustomed to pulling ards, plows and sledges. It is also clear that through the Early and Middle Bronze Age the inhabitants of the Kuban region placed an unusually high value on their vehicles: in funerals a wagon often served to carry the body of a distinguished man to his grave, and went with him to the Underworld. The wagons are as strong an argument as we are likely to find that PIE speakers should be located along the northern face of the Caucasus. It is likely that PIE was also spoken along the middle Volga, the Don and the smaller rivers flowing into the Sea of Azov, but the Maikop culture may have been an especially important part of the PIE homeland.

Because of its home-grown terms for wheeled vehicles we know (*contra* Heggarty and Renfrew)⁶⁵ that the maturation of PIE occurred between ca. 3500 and 3000 BC, and that it occurred in a land where wheeled vehicles were made and prized. Very few places meet that requirement. One of the earliest wagons was found under a kurgan at Bal’ki, on the left bank of the lower Dnieper and about 100 miles upstream from the coast. Many other wagons were found near the Dnieper in kurgan burials of the third millennium BC. These burial wagons,

however, were probably not made in the grassland steppe. It is possible that they were built in southeastern Crimea, where in antiquity the northern foothills of the Crimean mountain range were covered with hardwood trees: oak, beech, hornbeam and ash. We have, however, no evidence of wagons or settlements (and, as noted above, very little evidence even of food production) in Crimea in the fourth millennium BC.

The earliest *in corpore* evidence of wheeled vehicles anywhere comes from the Maikop culture. When Anthony wrote *The Horse the Wheel and Language* the earliest such evidence seemed to date ca. 3100 BC and came from two kurgan burials, one near the lower Dnieper and the other near the Kuban.⁶⁶ Still earlier evidence, available for some time, has only recently received attention.⁶⁷ In 1985 archaeologists at Starokorsunskaya, near the city of Krasnodar on the Kuban river, found the remains of a funeral wagon in a burial dating ca. 3300 BC. Atop the wooden cover of a pit-grave were poorly preserved remains of at least two (solid) wooden wheels. Enough of one wheel was preserved to determine that its diameter was ca. 60 cm, with an axle perforation of 18 cm.⁶⁸

For a long time wheeled vehicles remained a very important feature of life and death in the Kuban region. Archaeologists digging in the Novotitarovskaya area of the Kuban steppe have found 115 graves with wagons or wagon parts.⁶⁹ Wagons were also included in burials in other parts of the Kuban steppe, and Aleksandr Gej has observed that of all the wagons found in Early and Middle Bronze Age burials on the Eurasian steppe almost half have been found in the quite small Kuban territory.⁷⁰ Until a better candidate comes along, I will consider it likely that PIE was spoken along the Kuban—as well as along the Don and the middle Volga—during the pre-Maikop culture, and that during the subsequent Maikop period PIE matured.

The spread of Indo-European languages in the third millennium BC

Importantly, if somewhat circuitously, an argument about the spread of Indo-European languages through the steppe proceeds smoothly enough from the premise that the Maikop culture, with its cartwrights and wainwrights, was an important part of a wider PIE language community. It is now widely recognized, thanks in large part to arguments put forward by Andrew Sherratt and David Anthony, that wheeled vehicles enabled the exploitation of the grassland steppe during the late fourth and the third millennium BC.⁷¹ During this period the Yamna (pit-grave) archaeological culture spread over the grassland steppe from at least the Dnieper river in the west to the Ural in the east, and Indo-Europeanists are quite sure that Indo-European languages were spoken in most if not all of the Yamna culture.⁷² Before the Yamna period food-producers had lived along the rivers of the steppe, where fish were plentiful, winter foraging was available for animals, and agriculture was not terribly difficult. Away from the rivers, the steppe had been roamed by hunters and foragers (many hunter-gatherers of the Dnieper-Donets culture seem to have lived on the open steppe) but had not been occupied

by food-producers. Out in the steppe the sod was too tough for farmers in the fourth millennium BC to plow, although it did offer ample vegetation for grazing.

Wool, in contrast to milk and meat, was durable and marketable, and when woolly sheep began to replace hairy sheep (wild sheep have a hairy coat, and so did the early domesticates) the steppe may have become more attractive. As noted at the beginning of this chapter, all the branches of Indo-European inherited from PIE a word for wool and we must assume that wool was of some importance in the PIE culture. The earliest woolen textiles that archaeologists have found anywhere date to the fourth millennium BC. There is indirect evidence that in western Iran and a few other places certain varieties of sheep may have been bred for both meat and wool already in the sixth millennium BC, but Bill Darden concluded that “significant indications of wool technology do not occur anywhere until the fourth millennium.” Eventually wool became an important item of trade, and in Mesopotamia “workers’ wages were paid in wool, and exports of woolen cloths paid for the imports of raw materials.”⁷³ How important wool sheep were in the Yamna culture is debated. Some, but not all, osteological evidence suggests that the Yamna pastoralists depended more on their cattle than on their sheep.⁷⁴

However that may be, late in the fourth millennium BC it evidently became profitable to take flocks of sheep as well as herds of cattle deep into the steppe. Exactly how this pastoralism worked in the Bronze Age is not entirely clear. Until 1000 BC the steppe was not fully nomadic, because the pastoralists coexisted with agricultural villagers living along the river valleys (by ca. 700 BC all the villages were gone and the steppe was fully nomadic). The pastoralists of the late fourth and most of the third millennium BC are identified with the Yamna archaeological culture, which is well known from its burials in kurgans (each of which usually contained multiple burials) and most of the kurgans lie in the deep steppe. The pastoralists must have kept their flocks and herds not too far from the kurgans that they erected, but very few settlements have been found. This is in contrast to the subsequent Srubna (Timber Grave) period, when a good part of the steppe population lived in small settlements. A typical community of Yamna pastoralists must have had a temporary settlement, or nothing more than a camp, and moved from one spring, water hole or well to another when the immediately accessible steppe began to be overgrazed. Although evidence for agriculture is slight, a few crops were evidently planted and harvested.⁷⁵

Sherratt and Anthony argued convincingly that what allowed people to live on the open steppe, and to provide fresh pastures for their flocks and cattle over an immense area, was the wagon. In the first millennium BC the “Skythians” had no houses or huts but lived in their covered wagons,⁷⁶ and what evidence we have (and also what evidence we do not have) indicates that most pastoralists did the same already in the late fourth and the third millennium BC. The pastoralist’s wagon would have been covered with a canopy or tilt: a fabric—probably of felt—stretched over a wooden frame.⁷⁷ Every wagon was ponderous, with heavy planking and with tri-partite disk wheels, often a meter or more in diameter.⁷⁸ For the ancient pastoralists about whom we have information wagons were their “home”: in a

wagon they were conceived, in a wagon they were born, and their hope in life was to become wealthy enough to own several wagons, so that at their death they could be sent to the Underworld with a wagon.

Some of the vehicles that the nomadic pastoralists used may have been two-wheeled carts. Wagons carried more than carts, but in the fourth and third millennia BC wagons did not yet have pivoting front axles and were therefore difficult to turn. A two-wheeled cart, the wheels revolving on a fixed axle, could turn with no difficulty at all. The animals that drew both carts and wagons were of course oxen, usually castrated bulls. Teams of oxen in paired draft were sometimes sacrificed and placed in the burial chamber of a kurgan along with the funeral wagon.⁷⁹

The nomadic pastoralism that wheeled vehicles made possible must have spread the language of the vehicles' occupants through much of the Pontic-Caspian steppe and well beyond. A great virtue of Anthony's *The Horse the Wheel and Language* is its detailed argument for a connection between wheeled vehicles and what seems to have been a remarkable expansion of Indo-European languages in the third millennium BC. By the end of that millennium almost everyone in the Yamna archaeological culture, which extended over half a million square miles in the grassland steppe and even into the forest steppe, may have been speaking a language descended from PIE. During the third millennium BC the Dnieper-Donets culture of hunter-gatherers disappeared. We must suppose that the hunter-gatherers of this and other Mesolithic cultures were converted either to mobile pastoralism or to settlement on the river villages, and in either case they probably learned the pastoralists' language and forgot their own.⁸⁰ Over the vast territory from the southern Urals to the Dnieper the evolution from PIE into several daughter languages will have begun.

The expansion of PIE eastward from the Volga river in the third millennium BC evidently led to the formation of various languages, including what by 1500 BC can be recognized as Indo-Iranian. Michael Witzel has proposed that the language ancestral to Indo-Iranian was a *lingua franca* or a *koine* along the steppe as far to the east as the upper Yenisei river (the Yenisei languages, now almost extinct, included some loan-words from a very early stage of Indo-Iranian).⁸¹ Witzel also suggested that the language ancestral to Indo-Iranian was carried south from the steppe into the semi-desert and into the BMAC culture, where its speakers borrowed words that would eventually appear in both Vedic Sanskrit and Avestan. Still further to the east, the expansion of PIE apparently brought to the Tarim basin the seeds of what eventually would evolve into the Tocharian language, attested by Buddhist texts from the first millennium CE. Whether the earliest of the famous mummies from the Tarim basin were related to the continuation of such an eastward expansion is not certain, but James Mallory and Victor Mair have cautiously concluded that they were.⁸² DNA analyses tend to support that conclusion.

As Proto-Indo-Iranian began to form east of the Volga in the third millennium BC, at the same time Proto-Baltic apparently began to take shape west of the Volga and eventually to have been brought into northeastern Europe.⁸³ In modern times

the Baltic subgroup of Indo-European, with some very archaic features not far removed from PIE, is represented only by the Latvian and Lithuanian languages and was for that reason labeled “Baltic” by nineteenth-century philologists. Once upon a time, however, “Baltic” languages were apparently spoken over a much larger part of Eurasia. Because the oldest documents in any Baltic language are the catechisms written in Lithuanian and Old Prussian (now extinct) during the Lutheran Reformation, evidence for the extent of Baltic in ancient times comes mostly from river names. Mallory noted the presence of Baltic river names somewhat to the west and far to the east and the south of Latvia and Lithuania, and he reasonably assumed that various Baltic languages had been spoken there until they were submerged by the expansion of Germanic and Slavic languages in the first millennium CE. According to Mallory, “the minimal view would see the Balts, during the first millennium BC, occupying the area from west of the Vistula’s mouth east to Moscow and the upper Volga (which itself carries a Baltic name), and south almost as far as Kiev.”⁸⁴ Because “Baltic” names are attached to rivers more than 600 miles from the Baltic, Wolfgang Schmid argued that the PIE homeland was near the Baltic, and that migrations from that homeland spread the Indo-European languages through much of Europe and Asia.⁸⁵

Recent DNA analyses indicate that demic diffusion tended to go in the other direction: in the third millennium BC many people from the east moved westward to the Baltic and beyond.⁸⁶ Population geneticists have found that although people living in northern Europe in the fourth millennium BC had little or no DNA indicating what the geneticists call a “Yamna” (or “Yamnaya”) ancestry,⁸⁷ throughout the third millennium BC northern Europe experienced a considerable influx of people from the “Yamna” cultures of the east. More specifically, the geneticists concluded that the population of the Corded Ware culture of northern Europe (and to a lesser extent of the Bell Beaker culture) was in large part descended from ancestors who came from the Corded Ware culture further east.

The Corded Ware culture, which lasted through almost all of the third millennium BC, is an archaeological assemblage that stretched from the upper Volga to the Rhine. It is known mostly from graves, and although considerable evidence for settlements has been found the settlements were apparently small and of relatively short duration. Domesticated animals were important in the Corded Ware culture, and many of the people may have been mobile pastoralists. It is not at all unlikely that over the centuries a drift from the Yamna culture headed northward and westward and helped to form the Corded Ware culture. Northeastern Europe—from the Baltic to the Rhine—was in several respects more attractive than the lands that lay to the east in the same latitude. Agriculture and animal husbandry were far better established in the west: the Corded Ware culture was essentially the first culture east of the Baltic to depend on domesticated animals rather than on hunting,⁸⁸ while the Neolithic had come to northern Europe 2000 years earlier. Winters in northern Europe were not so cold as those in Russia. Also important was that proximity to the Baltic and the Kattegat extension of the North Sea meant access to amber, which was highly prized throughout the Corded Ware culture and also in the Yamna culture.

Evidently it was along the shores of the Baltic and the Kattegat seas that an influx from the southeast especially changed the population's DNA. One of the geneticists' studies shows that in modern Europe the highest percentage of Yamna ancestry is found in Norway, Lithuania and Estonia (with Iceland and Scotland close behind).⁸⁹ Even along the Baltic, however, the influx must have been gradual since here, according to a recent archaeological report on the region's Corded Ware culture, "no mass migrations have been observed."⁹⁰ What language or languages the immigrants were speaking on their arrival in northern Europe cannot of course be determined, but it is very likely that those who came from the southeast did speak an Indo-European language. The geneticists' findings therefore add some support, however shaky, to the possibility that in the third millennium BC the considerable area in which Proto-Baltic was spoken expanded into northeastern Europe.

Another area into which an Indo-European language seems to have expanded in the third millennium BC was southern Caucasia. Archaeological evidence is clear that after 2500 BC nomadic pastoralism became prevalent here. Eventually most of the Kura-Araxes settlements were abandoned, and those that remained through the Trialeti culture were relatively small.⁹¹ If PIE did not evolve in the Kura-Araxes culture, and we have good reason to think that it did not, it may have been with the arrival of nomadism in the third quarter of the third millennium BC that an Indo-European language first came to south Caucasia. Where the pastoralists may have come from, or whether most of them were simply Kura-Araxes villagers who had become pastoralists, is unclear. Those pastoralists who did not have local roots may have come from north of the Caucasus, but it is also possible that they came from the southeast. Some specialists have argued, that is, that pastoralists from northwestern Iran began filtering into southern Caucasia in the third millennium BC.⁹² We know only that in the middle of the second millennium BC Indo-Iranian was spoken in or near to southern Caucasia.

Most of this is very uncertain and unclear, but frames my suspicion—shared by many who know more about the topic than I do—that by the end of the third millennium BC several Indo-European languages were spoken over a very wide area, including much of the grassland steppe and the forest steppe far to the east of the Volga, the Corded Ware culture westward from the upper Volga into northeastern Europe, and probably also southern Caucasia. Informing the speculative is the certain and the near-certain. PIE was descended from Proto-Indo-Hittite, the indigenous language of western and southern Anatolia. Early in the seventh millennium BC people on Anatolia's western coast were fully engaged in the production of food, harvesting crops and depending on domestic animals for their meat. A growth of population followed the production of food and encouraged the colonizing of arable lands outside of western Anatolia. Among the first lands to be colonized were central Crete, Thessaly and the southern Balkans, from all of which the colonists remained in communication with the Proto-Indo-Hittite heartland. PIE must have evolved because Indo-Hittite colonists sailed—still on log boats or some other primitive craft—to a land farther away. The most likely locations for such a distant colonizing are lands along the northeastern shores of the Black Sea and the Sea of Azov. And the most likely

location for the evolution of PIE is northern Caucasia and the steppe along the Don and the middle Volga, as settlers speaking their Indo-Hittite language came into close and continuing contact with the native Mesolithic population.

After the maturation of PIE, late in the fourth millennium BC, it soon spread (thanks in large part to wheeled vehicles) through and well beyond the grassland steppe. As it spread, PIE must have evolved into several regional dialects and then—surely by the end of the third millennium BC—into several distinct languages. We have no reason to think, however, that at that time Indo-European languages were yet being spoken in most of Europe (in Greece and Italy, we can be quite certain, they were not), or that several important Indo-European subgroups—Keltic and Germanic, as well as Greek and Italic—had yet begun to form.

Notes

- 1 For a thorough review of the linguistic evidence for wheeled vehicles in Proto-Indo-European society see Meid 1994, pp. 57–64. For the most recent reviews see Pereltsvaig and Lewis 2015, pp. 171–174, and Anthony and Ringe 2015, pp. 201–206.
- 2 Fortson 2004, p. 39.
- 3 For Sturtevant’s “Indo-Hittite Hypothesis,” a lecture presented in 1938, see Sturtevant 1962.
- 4 Sturtevant 1962, p. 108.
- 5 Puhvel 1994, p. 252.
- 6 Melchert 1994, p. 3.
- 7 Melchert 2001, p. 233.
- 8 Lehrman 2001, p. 107. For his earlier work see Lehrman 1996.
- 9 For an explanation of the methodology and results of their work see Ringe, Warnow and Taylor 2002, pp. 59–129. At p. 97, in their search for the root node of the Indo-European tree, the authors conclude that “the root node must fall between Anatolian and the rest of the tree,” and that by far the most probable of the possible conclusions from their study is that “Anatolian is one first-order subgroup of the family, and all the other languages together constitute the other first-order subgroups.” The cladistics approach was subsequently extended by factoring in the effects of “network evolution,” but the original conclusions remain. For the research on subfamily networks see Nakhleh, Ringe and Warnow 2005.
- 10 For some caveats see Richard Alderson’s remarks at Drews 2001a, pp. 76–77.
- 11 See Sturtevant 1962, p. 106: “The Hittite verb of some thirty-five centuries ago was as different from the Sanskrit or the ancient Greek verb as the French or the English verb is today.”
- 12 See Dickinson 1999b, p. 97:

I feel rather strongly that students of the Indo-European languages should have paid greater attention than they mostly have, until now, to the unease that many archaeologists have been expressing for decades about the constant appeal to theories of migration as the main vehicle of linguistic spread.
- 13 Renfrew 1987, pp. 123–124.
- 14 Renfrew 1987, p. 124. Renfrew’s reference is to J. G. D. Clark, “The Invasion Hypothesis in British Prehistory,” *Antiquity* 40 (1966), pp. 172–189.
- 15 Dickinson 1999, p. 100.
- 16 Renfrew 1987, pp. 55–56 and 168–174. Had Renfrew made a distinction between the Anatolian languages and the Indo-European languages his thesis about the place of origin would probably have met with far less opposition than it has.

- 17 The quotation comes from p. 6 of Melchert forthcoming.
- 18 Melchert forthcoming, p. 7. Anthony and Ringe 2015, p. 208, also imagine a Proto-Anatolian migration ca. 4000 BC, from the steppe into the Balkans, and thence into Anatolia.
- 19 Darden 2001, p. 204, noted that “[t]here is a complex of reconstructed words that are PIE but not demonstrably PIH and that deal with wheels and wheeled vehicles.” Darden therefore (p. 208) took “the appearance of wheeled vehicles as a *terminus ante quem* for the division of PIH into PIE and PA.”
- 20 On this site see Rosenberg and Erim-Özdoğan 2011, pp. 126–131.
- 21 Rosenberg and Erim-Özdoğan 2011, p. 128.
- 22 On Shillourokambos and six other Aceramic Neolithic sites in Cyprus, the earliest dating to the 9th millennium BC, see Colledge and Conolly 2007, and especially their Chapter 4: “A Review and Synthesis of the Evidence for the Origins of Farming on Cyprus and Crete,” pp. 53–74.
- 23 Özbaşaran 2011, p. 106.
- 24 See Özbaşaran 2011, p. 101 (with Fig. 5.1) and p. 119.
- 25 See Çakırlar 2012. Çakırlar, a zooarchaeologist, concluded that the four food animals were brought to Ulucak simultaneously at the beginning of the 7th millennium BC. She also concluded that beef was eaten as often as sheep and goat meat.
- 26 Özdoğan 2011, p. S422.
- 27 Broodbank and Strasser 1991. Limited excavation in 1997 confirmed a date in the Aceramic Neolithic: see Efstratiou et al. 2004.
- 28 Broodbank and Strasser 1991, p. 241.
- 29 The earliest levels at Argissa contained bones of many sheep and a few other domesticated animals: ovicaprids accounted for about 85 percent of the bones, pigs for 10 percent, and cattle for 5 percent. The site was once considered to have been established in the Pre-Pottery Neolithic but that date should be lowered. See Reingruber 2008. Reingruber concluded that Argissa and other Early Neolithic sites on the Greek mainland were connected to western Anatolia entirely by sea routes.
- 30 According to Perlès 2001, p. 151, “Thessaly was unique in offering the rare opportunity to spread over a ‘two-dimensional network’ over a wide area . . . This in turn created unique conditions: each village was within sight of several others.”
- 31 Demetrios Theocharis, who re-excavated the Sesklo site in the 1950s, estimated the population as 3000 or 4000, but that has been scaled down drastically.
- 32 For the pottery found at Ilindentsi see Vieugué 2014.
- 33 On Kovachevo see Lichardus-Ippen et al. 2002. At p. 131 the authors suggest that there were:

numerous and successive direct relations between Asia Minor and the European continent. To see a region covering northern Greece and south-west Bulgaria as belonging to the same cultural entity as far back as the Early Neolithic, and not just in the Middle Neolithic, is indeed convincingly logical.

- 34 See especially Özdoğan 2011 p. S427:

What is clear is the fact that it was a dynamic era, and there was motivation to move or to migrate that was not common in other periods. What is also clear at this stage is the sustained relationship between the newly settled areas and the original homeland. I find this continuing connection to be extremely significant in understanding the mode of Neolithic expansion . . . [F]rom the earliest stage of the Pottery Neolithic up to the so-called Vinča period in the Balkans, there is an apparent parallelism in the primary cultural traits between Anatolia and the Balkans that is defined by Garašanin as the ‘Balkano-Anatolian culture complex’ (Garašanin 2000). This implies that moving groups somehow sustained contact

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- to keep track of what was happening in their original homeland, a pattern described as ‘chain migration’ by Anthony (1997, 24).
- 35 For the 2004 workshop see Lichter 2005. See also Krauss 2011.
- 36 Brami and Heyd 2011.
- 37 Finkelberg 1997, 2001 and 2005, pp. 49–50.
- 38 For the bilingual and its implications see Drews 2001b, pp. 257–258. To the citations there add Adiego 2007.
- 39 For details see Drews 2001b, pp. 261–262.
- 40 Carruba 1995, pp. 18–19.
- 41 Most recently in Heggarty and Renfrew 2014.
- 42 Zvelebil 1995. Zvelebil followed Renfrew in postulating Anatolia as the birthplace of PIE. Again, I would insist that if Proto-Indo-Hittite was indigenous to western and southern Anatolia, PIE must *ipso facto* have been spoken at a much later time and in a very different place.
- 43 For a recent summary see Häusler 2004, and especially p. 28. A variation of Häusler’s theory has been put forward by journalist Carl-Heinz Boettcher in a semi-popular book (Boettcher 1999). In the 5th millennium BC, Boettcher believes, warriors from the Ertebølle Culture of Denmark and southern Sweden conquered and imposed their PIE language on the peaceful Linearbandkeramik culture. From this hybrid came the TRB culture, in which PIE—as the language of the elite—was eventually dominant.
- 44 In the 19th century an Indo-European origin for the river names was explored by Robert Ferguson in his *The River Names of Europe*. (London: Williams and Norgate 1862). It was advocated at length by Hans Krahe, beginning in 1942 and culminating in his booklet *Unsere ältesten Flussnamen* (Wiesbaden: Harrassowitz, 1964). Krahe concluded there (pp. 81–82) that his *alteuropäische Hydronomie* was in place no later than the 2nd millennium BC. Although Krahe’s work is still highly regarded, it has been challenged by Theo Vennemann, who argues (Vennemann 2003) that the names were conferred on the rivers by speakers of “Vasconic” languages. Basque, the only surviving pre-Indo-European language in Europe, is a Vasconic language, as in classical antiquity may have been Iberian and Aquitanian. Vennemann proposes that in the Upper Paleolithic period Vasconic languages were widespread in southern Europe. As the last glacial period ended 12,000 years ago, and the population of southern Europe gradually pushed northward to avail itself of land newly freed from ice, Vasconic speakers gave names to the rivers that they found in central and northern Europe. Vennemann’s Vasconic thesis is controversial and not widely accepted, but his work shows how the river names in question can be analyzed in very different ways, leading to very different results.
- 45 Schmid 1972.
- 46 Ryan and Pitman 1998.
- 47 See, for example, Yanko-Hornbach, Gilbert and Dolukhanov 2007. Dolukhanov has done considerable research on the Neolithic period of the north shore of the Black Sea.
- 48 Matthews 2007, p. 28.
- 49 Matthews 2007, p. 31.
- 50 Motuzaite-Matuzeviciute, Telizhenko and Jones 2013 report that evidence for cereal, dating ca. 3500 BC, was found in a shell midden near Ardych-Burun, on the southeastern coast of the Crimea. Until this discovery, the earliest evidence for cereals in Crimea was from late in the 2nd millennium BC.
- 51 Gamkrelidze and Ivanov 1995.
- 52 Drews 1988, pp. 32–35.
- 53 That wheeled vehicles were first made in southern Caucasia was argued by Piggott 1969, but archaeologists have yet to find *in corpore* evidence for wheeled vehicles in southern Caucasia from either the 4th millennium BC or the first half of the third. They

have, however, found a number of clay models of two-wheeled carts. Indirect evidence comes from the conjunction of model wheels and Khirbet Kerak pottery: brightly burnished red and black kraters and bowls that were made on a potter's wheel. The ware was first found by William Albright almost 100 years ago at the southern end of the Sea of Galilee, where stands the tell called Khirbet al-Karak in Arabic and Tel Bet Yerah in Hebrew. Khirbet Kerak ware was subsequently found at various sites, from northwestern Iran to Jericho. Very different from (and superior to) Levantine ceramic traditions, Khirbet Kerak ware is now known to have originated in southern Caucasia, where it remained in common use through most of the 3rd millennium BC. Rafael Greenberg, who has directed excavations at Tel Bet Yerah, has recently published ten wheel models found at the site, one in stone and the others in clay, each with an axle perforation and a pronounced nave. See Greenberg 2014. Greenberg points out that we have no evidence for wheeled vehicles of any kind in the Levant until ca. 2800 BC, when model wheels—all with axle perforations and pronounced naves—began to be made and displayed, and that they show up only at sites and in strata where substantial amounts of Khirbet Kerak ware are also present. An important site outside the Levant is Norşuntepe, a copper-working center in eastern Anatolia, where “no less than 35 model wheels are catalogued” (Greenberg 2014, p. 95). The conjunction between model wheels and Khirbet Kerak ware leads Greenberg to speculate that early in the 3rd millennium BC people from the Kura-Araxes culture had not only the potter's wheel but also wheeled vehicles and therefore an advantage in mobility: with their ox-carts they may have brought themselves and their pottery to places far away from south Caucasia. It may be that wheeled vehicles were produced in southern Caucasia at a fairly early date, but not early enough—so far as we now know—for southern Caucasia to have been the homeland of PIE.

- 54 The map of the probable PIE homeland in Anthony 2007, Fig. 5.1, is approximately what I have in mind. Anthony and Ringe 2015 present good arguments that PIE evolved in this general area in the 4th millennium BC, but for both linguistic and archaeological reasons I must disagree with their assumption that this was also the homeland of Proto-Indo-Hittite (which they call “Early PIE”).
- 55 On the Dnieper-Donets culture see Mallory 1989, pp. 190–191; Anthony 2007, pp. 174–182; and Dolukhanov et al. 2009, pp. 789–790.
- 56 Dolukhanov et al. 2009, p. 789.
- 57 See Ivanova 2012, pp. 2–3: “In Gräbern und Siedlungen des 5. Jahrtausend v. Chr. im Nordkaukasus lässt sich eine materielle Kultur erkennen, die mit gleichzeitigen archäologischen Komplexen aus dem nördlichen und westlichen Schwarzmeer verwandt und in ein Netzwerk für „Prestige-Güter“ eingebunden war. Es handelt sich um einen entfernten Ableger der südosteuropäischen Kupferzeit.
- 58 On the dates of the lower Don culture see Telegin et al. 2003. The authors place the beginning of the Mariupol Neolithic ca. 6500 cal BC, and conclude that it coexisted with hunter-gatherers for a long time. For a lower date see Kotova 2010, p. 167:

The sites and cemeteries were excavated in the Northern Azov Sea region, which covers the territory from the Lower Don to the Kalmius River, and are dated to c. 6050–5200 cal BC. It disappeared during an arid period about 5200 cal BC, when the Sredny Stog culture was formed.

- 59 On the Khvalynsk culture see Anthony 2007, Fig. 9.1 and pp. 182–186.
- 60 For close parallels between artifacts in the pre-Maikop sites and sites along the lower Don see Ivanova 2007, p. 13.
- 61 Kohl 2007, pp. 72–86 has a full description of the Maikop kurgan and the Maikop culture.
- 62 Ivanova 2007, pp. 10–13.
- 63 Courcier 2014, pp. 621–622.

- 64 Bakker et al. 1999. See also Anthony 2007, pp. 65–72 and Bondár 2012, pp. 21–27.
- 65 In defending their thesis that PIE was spoken in central and western Anatolia in the 7th millennium BC Heggarty and Renfrew 2014, pp. 1690–1691, argue that the PIE terms for the elements of a wheeled vehicle must have been in use long before any wheeled vehicles existed, and therefore are useless for linguistic paleontology. The word for “wheel,” for example, had been around since people began talking about circles (the sun, the moon, etc.). This is certainly correct, but the crucial point is that late in the 4th millennium BC these traditional old nouns were applied by all Indo-European speakers to the elements of a brand new contraption: a wheeled vehicle. That this happened because PIE was still being spoken late in the 4th millennium BC makes good sense. It strains credulity that widely separated Indo-European subgroups, having been diverging geographically and linguistically from each other for more than 3000 years, could each have chosen the very same set of traditional old nouns for the parts of the new contraption. For criticism of Renfrew’s argument see especially Meid 1994, p. 63, and—more recently—Anthony and Ringe 2015 (I would commend that article more generally had Anthony and Ringe not posited a migration of Proto-Anatolian speakers from the steppe into Anatolia ca. 4000 BC).
- 66 Anthony 2007, p. 71: “The earliest radiocarbon dates on wood from steppe wagons average around 3300–2800 BCE. A wagon or cart grave at Bal’ki kurgan (grave 57) on the lower Dnieper was dated 4370+120 BP, or 3330–2880 BCE; and wood from a wagon buried in Ostanni kurgan 1 (grave 160) on the Kuban River was dated 4440+40 BP, or 3320–2930 BCE. The probability distributions for both dates lie predominantly before 3000 BCE, so both vehicles probably date before 3000 BCE. But these funeral vehicles can hardly have been the very first wagons used in the steppe.”
- 67 See Schier 2015. At pp. 112–113 Schier writes: “A key role in the development and transfer of wagon technology can probably be assigned to the Majkop culture, located in the north-western foreland of the Caucasus.” He assumes that some of the required technology may have come from contact with Late Uruk. “The earliest wagon from a burial context comes from the middle phase (Kostromskaya-Inozemcevo) of the Majkop culture, dated *c.* 3500–3200 BC.”
- 68 Trifonov 2004, p. 168.
- 69 Gej 2004, p. 177.
- 70 Gej 2004, p. 178: “Die Wagen aus den Kubangebiet machen damit fast die Hälfte aller entsprechenden Funde aus der Steppe in der frühen und mittleren Bronzezeit aus.” At p. 177 Gej reports that according to his own count 257 steppe burials have been found to contain wagons or parts of wagons.
- 71 Sherratt 1981 and 1983; Anthony 1986, and most fully Anthony 2007, Chapter 13 (pp. 300–339), “Wagon-Dwellers of the Steppe: The Speakers of Proto-Indo-European.”
- 72 On the Yamna (or Yamnaya) culture see Mallory 1989, pp. 210–215; cf. Fortson 2004, pp. 43–44.
- 73 Darden 2001, p. 196. Darden’s pp. 196–204 provide an excellent overview of the earliest evidence for wool sheep.
- 74 For the relative preponderance of cattle bones see Kohl 2007, p. 162. In contrast, Anthony 2007, pp. 297–298, notes that in the grassland steppe along the lower Don ovicaprids account for 25 percent of the bones recovered, outnumbering cattle bones.
- 75 Kohl 2007, p. 128, comments on “the lack of empirical evidence supporting the cultivation of domesticated cereals throughout nearly the entire duration of the Bronze Age.” At pp. 144–145, however, Kohl notes that “occasionally implements, like grinding stones and horn mattocks, have been found in Pit-Grave kurgans that presumably were used in some form of agricultural activity.”
- 76 Herodotos 4.46, 114, and 121; compare Ammianus Marcellinus 31.2.10 and 18 on the wagons of the Huns and Alans.

- 77 See Piggott 1983, p. 21, for the “bent yew framework of the arched tilt” on a Late Bronze Age wagon excavated at Lchashen in Armenia. This kind of covering is probably also what the Biblical writer (Numbers 7: 1–5) had in mind when he has the chiefs of Israel bringing to Moses twelve oxen and six covered wagons for service in the cult of Yahweh.
- 78 On the wheels of the well-preserved Lake Sevan wagons see Piggott 1983, pp. 72–73.
- 79 On the practice see Jeunesse 2006.
- 80 On the Dnieper-Donets culture see Mallory 1989, pp. 190–191; Anthony 2007, pp. 174–182; and Dolukhanov et al. 2009.
- 81 Witzel 2003, p. 50.
- 82 See Mallory and Mair 2000.
- 83 It has long been thought, on archaeological grounds, that the Proto-Baltic language was brought to the Baltic in the 3rd millennium BC. In *The Balts* Gimbutas put the arrival of Indo-Europeans in Baltic lands soon after 2200 BC, and she identified them with the Corded Ware culture (see Gimbutas 1963a, pp. 38–44). On the basis of water names Balode and Holvoet 2001, p. 44, suggest that a Finno-Ugrian language was once spoken in Lithuania, but faded when people of the Corded Ware culture began arriving.

These were probably Indo-Europeans, but it is not clear whether they were Balts. The next migration wave, associated with the Hatched Pottery Culture, was certainly Baltic. It extended over a large area, stretching from the river Daugava in the North to the Pripiet in the South, and the upper reaches of the Volga and the Oka in the East.
- 84 Mallory 1989, p. 84.
- 85 Schmid 1972.
- 86 Haak et al. 2015; Allentoft et al. 2015.
- 87 What the geneticists call the Yamna (or Yamnaya) culture apparently also includes the pastoral population that early in the 3rd millennium BC lived in the eastern region of the Corded Ware archaeological culture, which stretched as far east as Nizhny Novgorod, 250 miles east of Moscow. For the assumed derivation of the eastern Corded Ware population from the Yamna population see Fig.1 in Allentoft et al. 2015.
- 88 On the concurrence in lands along the Baltic (and especially in Estonia) of animal domestication and the Corded Ware culture see Lõugas, Kriiska and Maldre 2007.
- 89 Haak et al. 2015, Fig. 3. For somewhat different results see Allentoft et al. 2015, Fig. 2.
- 90 Lõugas, Kriiska, and Maldre 2007, p. 22.
- 91 On the transition from the sedentary Kura-Araxes culture of south Caucasia to the pastoral Early Kurgan and Trialeti cultures see Smith 2005, pp. 260–261, and Kohl 2007, pp. 113–120. By ca. 2300 BC the same kind of wagons in use north of the Caucasus began to appear in kurgan burials in south Caucasia, although far fewer have been found in the south than in the north.
- 92 See Kushnareva 1997, p. 82.

2 The Kurgan theory and the taming of horses

For a long time most archaeologists and historians, including the present writer,¹ did not know when mounted combat began. In the nineteenth and early twentieth century some historians assumed that even in deepest antiquity people had been riding horses, and several Indo-Europeanists imagined that “the Aryans” of the Battle Axe and Bell Beaker cultures were adept as mounted archers. In 1939 Hanns Potratz, an equestrian and a Hittitologist, published a short article on the beginnings of horsemanship.² Far from challenging the belief in Neolithic riders, Potratz encouraged it, declaring that in the horse’s natural habitat riding began almost immediately after domestication, and that a Neolithic rider was able to control his mount merely with his voice, his knees, and perhaps a simple halter and neckstraps.

A few years earlier, and with great care, Gertrud Hermes had pointed out that in Europe there was no evidence for riding or indeed for “tamed” horses during the Neolithic period and the Early Bronze Age.³ More generally, textual and pictorial evidence suggested to some scholars that the riding of horses came later than the driving of horses: it was fairly clear that in India, the Near East and Greece horses were seldom ridden in the second millennium BC, while the driving of chariot horses was frequent and widespread. The priority of driving over riding in these lands was strongly supported by Josef Wiesner’s *Fahren und Reiten in Alteuropa und im alten Orient*.⁴

Gimbutas’ Kurgan theory

However certain Hermes and Wiesner were that horses were seldom ridden in Neolithic or Bronze Age Europe and the Near East, neither of them excluded the possibility that on the Eurasian steppe—the natural habitat of the wild horse—good riding may have been common already in the third millennium BC. In the second half of the twentieth century belief spread that on the steppe men were routinely riding horses not only all through the second millennium BC but already in the third, the fourth, or even the fifth, and that through all that time they were controlling their mounts well enough to engage in some kind of armed combat. The belief was bolstered early in the 1960s by Dmitriy Telegin’s excavations of a Neolithic village at Dereivka, on the right bank of the middle Dnieper. Telegin found that the several dozen people in the village, which was carbon dated to ca.

4000 BC, regularly ate horsemeat (three-fourths of the bones from hearths and kitchen dumps were horse bones). Concluding from the osteological evidence that the horses were domesticated rather than wild, and assuming that domesticated horses must have been controlled by herders on horseback, Telegin looked for signs of riding. Among the several graves that he excavated Telegin found a “head and hoofs” burial of a stallion, a ritual common on the steppe during the Iron Age and a sure sign of a riding society. In other sectors of his Dereivka excavations Telegin found six perforated antler tines, which he interpreted as cheekpieces for bridles.⁵ For more than a generation the Dereivka “evidence” muddled the history of horsemanship, but in 1997 David Anthony and Dorcas Brown carbon dated the skull from the head and hoofs burial of the stallion and learned that the burial was an Iron Age intrusion into an otherwise Neolithic site: the stallion died no earlier than 700 BC and possibly as late as 200 BC.⁶ As for the six “cheekpieces,” the perforated antler tines at Neolithic Dereivka—as at Neolithic villages far removed from horse country—can be more easily identified as piercing or boring tools.⁷

That the Dereivka and other Neolithic antler tines were cheekpieces was argued most vigorously by Marija Gimbutas, who headed the Indo-European program at UCLA, founded the *Journal of Indo-European Studies*, and from the 1960s until her death in 1994 was one of the English-speaking world’s most celebrated scholars. Gimbutas argued that horses were commonly bitted, bridled and ridden on the steppe already in the fifth millennium BC. Over three decades of publication Gimbutas’ principal thesis—her “Kurgan theory”—was that from the fifth to the third millennium BC Europe was Indo-Europeanized as waves of riders from the steppe invaded and conquered Europe, bringing with them their Indo-European languages and their warlike way of life, and erecting conspicuous kurgans (in Russian, a burial mound or barrow is a *kurgan*) in which to bury their chiefs.⁸

Although not many kurgans dating so early as the fourth millennium BC have been found, Gimbutas was perhaps correct in saying that PIE speakers buried their leaders under kurgans. As Benjamin Fortson has summarized the topic,

Ancient IE texts describing burials, especially of kings or warriors, are known from several branches, and although they do not agree with one another in every detail, they allow us to piece together a reasonably good picture of PIE burial practices. A dead person was buried in his own individual tomb that was like a mortuary house and heaped over with earth (a tumulus or burial mound). The corpse was sometimes cremated; this was the norm in the Indo-Iranian world and a special honor for heroes in ancient Scandinavia. Buried with the deceased were various grave goods, including ornaments, food, clothing, weapons, tools, and often wheeled vehicles, sacrificed animals, and even people. All these things would be needed in the afterlife.⁹

Although the practice of heaping up a tumulus over the grave of a deceased notable—and stocking the grave with a lavish *corredo*—may have been common among PIE speakers, it was not restricted to them. Kurgans—thousands of them—

were erected especially on the Eurasian steppe, but tumuli were also raised not only in southern Caucasia, Anatolia and Europe, but also in places remote from anything Indo-European: the Levant, Mongolia, China, Japan, Neolithic Britain, and even the lands roamed by the Mound Builders during the Middle Woodland period of North America. Burial under a tumulus was obviously a high priority for the rich and powerful, who wished to spend the Afterlife in a home that was both spacious and pre-eminent. The epitome of burial mounds is Khufu's pyramid at Giza.

While the PIE speakers may have buried their leaders under kurgans, it is not likely that they were warlike, and it is quite impossible that they were horseback riders. Against the "riders" character of steppe prehistory a few scholars, who were knowledgeable about both horses and steppe archaeology, objected that there was no solid evidence for riding on the steppe during the Neolithic period or even the Bronze Age. Already in 1956 the hippologist Franz Hančar had made the point clearly, although in a huge German book that few American historians read or even knew about.¹⁰ By 1990 the same point had been made by Colin Renfrew, Marsha Levine and relentlessly by Alexander Häusler. In a series of articles in specialized German periodicals Häusler dismissed the Gimbutas reconstruction of steppe prehistory and the Indo-Europeanizing of Europe as a *Phantasieprodukt*.¹¹ Soviet archaeologists also, finding little or no evidence of riding in Neolithic contexts, tended to be critical of Gimbutas' reconstruction. Especially notable among the Soviet skeptics was Elena Kuz'mina.¹²

Research on chariotry in the Late Bronze Age steered me toward Hančar, Häusler and the skeptics, and eventually I addressed the riding question in detail.¹³ My conclusions were that—as the skeptics had been saying for some time—mounted combat began no earlier than the tenth century BC, whether on the steppe or anywhere else (it appears that early in the Iron Age superior biting, especially the use of jointed snaffle bits, for the first time made secure riding possible). From the late eighth to the early fifth century BC men on horseback dominated the ancient world, first in the Kimmerian and Skythian raids and then in the Median and Persian empires. At Plataia in 479 BC the Persian cavalry was virtually annihilated by Greek hoplites, and for the rest of classical antiquity cavalry's role on the battlefield was secondary to that of heavy infantry.

Prior to the tenth century BC men had indeed ridden horses from time to time, but mounted warriors were of no consequence and were nowhere mentioned or portrayed. Although occasional riding had been done all through the second millennium BC it was tentative and insecure. The few textual references to riders in this period are never to mounted warriors, and when a rider is depicted in a relief—usually as a fugitive from a chariot battle—or on a figurine he is sitting not just behind the withers, where he belongs, but toward the rear of the horse. Chariotry was therefore the only military horse troop during the second millennium BC, and large kingdoms employed thousands of chariot drivers and chariot archers. No riding of horses is attested anywhere, either pictorially or textually, until shortly before 2000 BC. A corollary of all this is that Gimbutas' narrative—that from the fifth to the third millennium BC Europe was Indo-Europeanized by

waves of mounted warriors from the steppes—is indeed a *Phantasieprodukt*, to use Häusler’s term.

A revised Kurgan theory

Despite its considerable flaws, the Kurgan theory is alive and well. In his useful textbook, *Indo-European Language and Culture*, Fortson writes that although Gimbutas’ theory has its detractors, “it is fair to say that one or another version of the kurgan theory is accepted by most archaeologists and Indo-Europeanists today.”¹⁴ The most influential version of the Kurgan theory, significantly revised from Gimbutas’ original, has been formulated by David Anthony. At Hartwick College, in Oneonta, New York, Anthony together with Dorcas Brown organized and leads the Institute for Ancient Equestrian Studies. Anthony’s initiatives—in carbon dating, in excavations, and in other matters—have considerably advanced our understanding not only of the horse in the ancient world but also of the pre-history of the Eurasian steppe. On the commencement of secure riding, however, I am quite sure that he is mistaken. Beginning with his doctoral dissertation in 1985, Anthony has in a score of publications advocated several revisions of Gimbutas’ narrative. In his *The Horse the Wheel and Language: How Bronze-Age Riders from the Eurasian Steppes shaped the Modern World*, published in 2007, Anthony presented at length a demilitarized version of the Kurgan theory. Although on its central thesis we are in plain disagreement, I find Anthony’s book lively, imaginative and on many points very helpful. Especially valuable is his survey and synthesis of what Soviet and Russian archaeologists have discovered about the Neolithic and Bronze Age steppe. It will be obvious how much I am indebted to his work, and I regret that this chapter must focus on what I find wrong with it.

Much is at stake, however, in Anthony’s central thesis: that in the fourth millennium BC horseback riders from the steppes began bringing the Indo-European languages to Europe. In one very important respect Anthony’s scenario differs significantly from that put forward by Gimbutas: she had reckoned with conquests, but Anthony reckons with a mostly peaceful movement, conceding that until ca. 1000 BC riders had little or no role in combat.¹⁵ Although his Chalcolithic riders are not conquerors, their language spreads over much of central Europe because they are successful at raiding flocks and herds, and because they have the prestige of horsemen. In contrast, “the pre-Indo-European languages of Europe were abandoned because they were linked to membership in social groups that became stigmatized.”¹⁶ Specifically, Anthony proposes that beginning about 3300 BC, very shortly after the invention of the wheeled vehicle, the Keltic, Italic and Germanic subgroups of IE began to form, as “people of the Yamnaya horizon moved in significant numbers into the lower Danubian valley and the Carpathian Basin. This was a true ‘folk migration,’ a massive and sustained flow of outsiders into a previously settled landscape.”¹⁷

Anthony’s explanation of where, when and why PIE began to break up into the several branches of Indo-European becomes more significant as linguists begin to make use of it. Frederik Kortlandt, who has published extensively on phonology

and morphology in the Baltic and Slavic languages, as well as in Italo-Keltic, finds persuasive not only Anthony's identification of the PIE speakers' homeland in Ukraine but also their reason for leaving it:

Population movements are determined by three factors. First, there must be a reason to leave one's homeland. This factor has rightly been stressed by Anthony, who observes that people living along the boundary between the poorer lowland steppe and the richer upland forest 'risked periodic exposure to severe stress, for small variations in precipitation, temperature, population density or deforestation rate would dramatically alter the local distribution of critical resources in these fragile borderland communities' (1986, 292). This periodic exposure to severe stress prompted expansion when the opportunity presented itself.¹⁸

A second factor is that the migrators must know of a land more desirable than the one where they live. "Thirdly," Kortlandt continues, "the cost of the journey must not be prohibitive. It is now generally recognized that the domestication of the horse played a crucial part in reducing the cost of physical mobility."

Benjamin Fortson also finds Anthony's scenario attractive. While acknowledging how controversial is Anthony's conclusion that horses were ridden all through the fourth millennium BC, Fortson cautiously accepts the conclusion and builds upon it:

This has enormous consequences for the whole question of the IE homeland and expansions. Anthony and his colleagues have emphasized that the advantages lent by horseback riding are far more than just military, especially for a people who had previously been confined to riverine forested regions for their livelihood. Horseback riding would have allowed the population to scout far and wide for new pastures, transport goods quickly, undertake large-scale livestock breeding and herding, sustain a mobile and flexible pastoral economy, and engage efficiently in long-distance trading (as well as raiding and warfare).¹⁹

Fortson assumes, reasonably enough, that PIE was widely spoken in the Yamna culture, but then follows Anthony in proposing that ca. 3000 BC the Indo-Europeanizing of Europe began as Yamna riders pushed westward into central Europe.²⁰ The entire scenario, Fortson admits,

hinges crucially on the date of the domestication of the horse, and of horseback riding in particular. Both of these are hotly debated issues, although more and more scholars agree that the horse was at least domesticated by the time of the Yamna.²¹

Although I have no doubt that the horse was domesticated by the time of the Yamna culture, and probably 1000 years earlier, I am just as sure that in the fourth

millennium BC horses were food animals, sharing the life and fate of cattle, pigs, sheep and goats. Anthony's narrative is different from Gimbutas' narrative but no more tenable, because it retrojects a horse-riding society to an impossibly early date. In what follows in this chapter I shall summarize, modify and update what I have presented elsewhere at some length.

Horses as food animals

Since the end of the Pleistocene horses had been by far the most common game animal on the Eurasian steppes, and they were certainly domesticated as a meat animal before 3700 BC. Excavations at Botai and Khodzai in northern Kazakhstan have shown that the Chalcolithic population there was almost entirely dependent upon horsemeat for its protein. At Botai, as Anthony has detailed, some 300,000 animal bones were found in house-pits, and although bones or teeth of an occasional deer, bovid, elk or boar have been identified, over 99 percent of the bones came from horses.²² The steppe was home to huge numbers of wild horses, and many of the horses eaten in northern Kazakhstan were probably killed by hunters. Marsha Levine, who believes that domestication of the horse did not occur much before the end of the third millennium BC, argues that all of the Botai and Khodzai horses were killed by hunters, in herd drives.²³ It is reported, however, that the excavators found evidence for the penning of horses at these sites, and that an analysis of the pottery discovered a residue left by mare's milk.²⁴ Although most domestic mares have no objection to being milked, milking a wild mare would have been an adventure.

There is good reason to think that horses were domesticated long before the 3700 BC date from Botai and Khodzai. At Dereivka, as mentioned above, Dmitriy Telegin found that approximately 75 percent of the bones—largely left in hearths and kitchen middens—at this Neolithic site came from horses. Levine argues on the basis of the slaughter pattern that these were wild horses, killed by hunters, and on the same basis Anthony argues that they were domestic.²⁵ By the late fifth millennium BC the domestication of food animals was widespread in the steppe and it would not be very surprising if by then the Neolithic villagers at Dereivka had domesticated horses, which were ubiquitous in the steppe (because so well adapted for that environment).²⁶ Villagers in the forest steppe along the Volga may have been keeping horses even in the middle of the fifth millennium BC: the eleven horses slaughtered as funerary victims at Khvalynsk—like the sheep, goats and cattle sacrificed in the same cemetery—were very likely domestic animals kept for their meat.²⁷

Equids as pack animals

Initially all of the domesticates were valued exclusively as a source of food, but eventually people learned that some of their animals could be useful in other ways. What Andrew Sherratt called the Secondary Products Revolution seems to have been a drawn-out process in the second half of the fourth millennium BC.²⁸

By 3000 BC sheep were raised primarily for their wool, and castrated oxen were valued as draft animals useful for pulling sledges and plows. Early in this period the first wheeled vehicles were built, and the invention quickly spread across much of western Eurasia. These heavy vehicles were almost always drawn by a yoked team of oxen.

Perhaps because of their river and their many canals and waterways the Egyptians were very slow to adopt the wheeled vehicle (the first wheeled vehicle attested in Egypt—as in several other lands along the Mediterranean—is the chariot).²⁹ They may have been the first, however, to make use of pack animals. During the Old Kingdom and the Middle Kingdom the Egyptians depended upon the donkey's back for land transport. Recent discoveries have shed some light on the domestication of the African wild ass (*Equus africanus*), which in its domesticated state is usually called a donkey (*Equus africanus asinus*). As its taxonomic designation indicates, the wild ass was domesticated in Africa, where it became a food animal providing both milk and meat. Domestication seems to have occurred late in the fifth millennium BC.

Well before 3000 BC donkeys in Upper Egypt were trained to carry loads. A century ago Sir Flinders Petrie found three *Equus africanus* skeletons in a First Dynasty tomb, but it was not clear whether the skeletons belonged to food animals or to pack animals, or even whether the animals had been wild or domesticated. We now have more certain evidence for the early employment of the donkey as a pack animal. At Abydos, not far downstream from Karnak and Luxor, archaeologists from the Cairo branch of the Deutsches Archäologisches Institut excavated a huge mortuary complex. The complex contained the bodies of a First Dynasty king and—buried in rows of separate small tombs—some 200 retainers (officials, servants, artisans) who were sacrificially killed and buried with their king. The identity of the king is uncertain, but Aha and Djer are likely candidates. Although the human sacrificial burials have received most attention, as testimony to the exalted position of the king as well as to the grim superstitions of the period, our interest is in three brick tombs excavated in 2002. These tombs contained the fully articulated skeletons of ten donkeys, who also accompanied the king into the Afterlife. A study of the ten donkey skeletons, the most and the earliest ever found, concluded that the donkeys had been used as pack animals, incurring perceptible anatomical damage because of the loads that they had carried.³⁰ In Old Kingdom reliefs the donkey is often shown as a beast of burden.

Although as food animals donkeys had been less valuable than cattle, sheep, goats and pigs, once people learned to use the donkey to carry loads (and occasional riders) its value greatly increased. A tough animal and superbly fitted to semi-desert environments, singly or in caravans a donkey could carry a 200-pound load for a short distance and a 100-pound load from one city to another. Use of the donkey as a pack animal, and occasionally as a riding animal, spread quickly from Egypt through the Levant. In the southern Levant the fashioning of clay figurines of a donkey laden with panniers began no later than the start of the third millennium BC.³¹

In Mesopotamia and western Iran the native equid was the Asiatic wild ass or onager (*Equus hemionus*). The onager is larger and stronger than a donkey but hardly manageable, and it has recently been argued that in the third millennium BC the Sumerians were in possession of a domesticated species of onager (*Equus hemionus pumellii*) that subsequently became extinct.³² It is more widely supposed that the Sumerians crossed the onager with a donkey, to produce a hybrid that was physically and temperamentally suited for work as a pack animal and a draft animal. A copper or bronze nose-ring, to which a rope was tied, was often used for controlling a large animal. On the “peace” side of the Ur Standard, from ca. 2500 BC, oxen are shown being led in that manner, and on the “war” side the equids (possibly donkey-onager hybrids) drawing heavy wagons are likewise controlled by nose-rings. Donkeys could be managed by less severe devices: a halter or a simple nose-band was usually sufficient.

In modern times the donkey has often been associated with poor and backward economies, but in the Near East in the third millennium BC it connoted wealth. During the Old and Middle Kingdoms in Egypt donkeys continued to be slaughtered at elite tombs, in order to accompany the deceased into the Afterlife. In Syria and Mesopotamia during the third millennium BC donkeys were sacrificed at various temples, where their meat was evidently consumed by the resident god and his worshippers. Donkeys were also sacrificed before the construction of a wall or a large building, and their skeletons have been found in Early Bronze Age foundation deposits. The ritual role of the donkey in Early and Middle Bronze Age societies has received increased attention with the discovery of burials at Tell Brak in Syria and at Tel Haror in southern Israel.³³

From the steppe no representation of a pack animal has been found in Neolithic or Early Bronze Age contexts. Because horses had long been domesticated on the steppe as food animals, however, it is very likely that after Andrew Sherratt’s “Secondary Products Revolution” some horses were pressed into service as pack animals. We may also assume that—like the donkey in the Near East—a horse accustomed to carry packs on the steppe would occasionally have been ridden by its Neolithic owner. Without great difficulty an older gelding or mare could have been trained to accept a passenger, while another person led the animal by a rope attached to a nose-band or a halter. We may also assume that on the steppe from time to time a young man—more daringly, and perhaps to entertain or impress onlookers—without accompaniment by a pedestrian handler would have ridden a domesticated horse, attempting to exercise some control over it by a nose-band or another rudimentary device. For the inhabitants of the Eurasian steppe the horse was the epitome of speed. The Proto-Indo-European word for “horse” was **ékwo-*, a noun related to **oku-s*, the PIE adjective for “swift.”³⁴

Neolithic riders?

Although more than accompanied or athletic riding of horses cannot be assumed until the end of the third millennium BC, it has long been argued that villagers on the steppe had been riding horses regularly and efficiently already in the third,

fourth and even the fifth. According to the thesis advocated by Gimbutas until the early 1990s and in recent decades by Anthony, for hunting and herding purposes villagers on the steppe were riding horses as early as 4200 BC, controlling their mounts with reins and organic bits. Along with many others who have written on the subject, Gimbutas and Anthony assumed that the domestication of horses as food animals required the herding of horses, which of course could not have been done unless the herder was riding a horse.³⁵ “It is unthinkable,” Gimbutas was right in stating, “that herds of horses could be controlled on foot.”³⁶ I doubt, however, that domesticated horses at Neolithic Khvalynsk, Dereivka or other steppe villages were any more in need of herding than were domesticated cattle. By definition animals that are domesticated have a bond to their *domus*, their home. Unlike sheep, goats, or other small animals taken away from home and into places where danger lurks, horses do not need a herdsman and his dog to protect them, and horses raised as domesticates are likely to stay fairly close to home. If the foals were tethered, the mares would not have strayed far from the village and would have returned to be suckled by their foals and milked by the villagers. The villagers’ stallion would be the first line of defense against any wild stallion that tried to elope with the mares, and all the horses would have learned to appreciate a shed for shelter and for shade. Feeding calls—for fodder in the winter, and for a bit of grain at any time—would have brought all of the herd home promptly.

The evidence presented to support the contention that horses were routinely ridden in the fifth and fourth millennium BC is the substantial beveling on seven of thirty-one equine pre-molars (the P₂s) recovered from the house-pits at Botai and Khozai.³⁷ These seven P₂s, which necessarily came from at least four horses, show a beveling of at least 3 mm, and Anthony argues that such beveling can only have resulted from the horses’ chewing—over an extended period of time—on organic mouthpieces with which they were bitted. The twenty-four other P₂s located at the sites also exhibited beveling, although less than 3 mm. One could argue that the twelve or more horses from which the less beveled P₂s came had also been bitted and ridden, although less frequently than the four horses whose P₂s were more beveled. Contrarily, one could argue that whatever the twelve horses chewed in order to bevel their P₂s slightly must have been chewed more frequently or more vigorously by the four horses whose P₂s were beveled more substantially.

That horses were not routinely ridden at Dereivka ca. 4200 BC, and at Botai and Khozai ca. 3700 BC, is of course impossible to prove. Some considerations, however, weigh heavily against that possibility. To begin, one may wonder why horses that were giving service as mounts should have been slaughtered and eaten by the Botai villagers. In a famine the butchering of a riding horse might from time to time have been necessary, but wild horses were obviously ubiquitous in northern Khazakstan in Chalcolithic times. At the least one would have to concede that at Botai the bonding between horse and rider was no closer than the bond between a food animal and its owner. Also detrimental for Anthony’s thesis is a recent analysis of the faunal evidence at Begash, in southeastern Kazakhstan. The analysts concluded that at Begash the real shift to horses occurred not in the fifth or fourth millennium BC but at the end of the second.³⁸

Much more puzzling than the butchering of riding horses is that an invention of the bit ca. 4200 BC could have been of so little consequence that no demonstrable element of a bit appears anywhere in the archaeological record until shortly before 2000 BC. Obviously useful inventions normally proliferated within centuries rather than millennia. The first wheeled vehicles were produced in the second half of the fourth millennium BC, and by the end of that millennium wheeled vehicles are archeologically attested from Denmark to central Asia and the Persian Gulf. The spoked wheel first appeared at the end of the third millennium BC, and again we have evidence that light, spoke-wheeled carts were soon in vogue over much of the steppe and the Near East. Stirrups appeared in China in the fourth century CE and by the eighth were in use in western Europe.³⁹ If horses were routinely and competently ridden in the steppe already in the fifth millennium BC at least a few of them should eventually have been obtained by Near Eastern kings. But until the end of the third millennium BC the donkey or onager-donkey hybrid remained the only equid of value and significance in all of the Near East.

The earliest demonstrable cheekpieces, and so the earliest demonstrable bit, can now be dated—thanks to Anthony's own initiative—to shortly before 2000 BC. It is hardly coincidental that at just that time a documented surge of interest in the horse began. We know, that is, that the riding and especially the driving of horses has been continuous from the end of the third millennium BC to the present day. Evolution of the bit was also continuous and relatively rapid. At its first demonstrable appearance, ca. 2000 BC, the bit was primitive and was made entirely of organic materials. By 1700 BC metal bits were in use and by the fourteenth century BC many drivers used jointed snaffle bits made of bronze, not much different in design from the standard bit in use all over the world today. In contrast, no evolution of the bit had occurred in the millennia preceding 2000 BC. A comment by Philip Kohl is pertinent:

Perhaps, horses were initially “domesticated” on the Ukrainian steppes in the fifth millennium or in western Kazakhstan by the mid-fourth millennium BC, but, if so, the effects of such horse domestication were not felt throughout the greater Ancient Near East and Europe until much later. . . . Christopher Columbus discovered America, not Leif Eriksson.⁴⁰

According to Anthony the invention of the bit ca. 4200 BC did have consequences, and they were enormous. No connection between these consequences and the invention of the bit, however, is demonstrable. In Anthony's scenario the riders in the steppe begin raiding flocks and herds, and the raids lead to social and economic upheaval: the collapse ca. 4000 BC of what Gimbutas called “Old Europe” (the numerous agricultural settlements in the lands along the lower Danube and its tributaries), the creation ca. 3700 BC and the demise ca. 3400 BC of the super-towns in the forest steppe between the Bug and the Dnieper, and ultimately the Indo-Europeanizing of Anatolia, the Balkans, and the rest of Europe.

So far as the end of “Old Europe” is concerned, Anthony suggests that it was the result of raids from the steppe by riders whose language was ancestral to Indo-European:

Raiding parties of a dozen riders could move fifty to seventy-five head of cattle or horses fairly quickly over hundreds of kilometers. Thieving raids would have led to deaths, and then to more serious killing and revenge raids. A cycle of warfare from thieving to revenge raids probably contributed to the collapse of the tell towns of the Danube valley.⁴¹

In a folk migration the mounted herders and raiders from the Dnieper valley move westward. "Their move into the lower Danube valley probably was the historical event that separated the Pre-Anatolian dialects from the Proto-Indo-European language communities back in the steppes."⁴² Anthony suggests that ca. 3000 BC, after living in the valley of the lower Danube for 1000 years and establishing the Suvorovo archaeological culture of eastern Bulgaria, the Proto-Anatolian speakers finally moved—with their riding horses—to Anatolia.⁴³

In the lands along the lower and middle Danube horses were certainly more common in the fourth and third millennia BC than they had been in the sixth and fifth. Although bone evidence shows that at most sites horses were far outnumbered by cattle, pigs, sheep and goats, at Csepel-Háros in eastern Hungary slightly more than half the animal bones found in Bell Beaker levels of the late third millennium BC were horse bones.⁴⁴ There is no evidence, however, that in Chalcolithic Europe horses were anything other than food animals, the taste for horsemeat having spread from the Eurasian steppe into what had been "Old Europe." As for the Suvorovo people riding horses into Anatolia ca. 3000 BC, our first chapter has shown the evidence that the Anatolian languages were indigenous to western Anatolia. Another huge problem is that throughout the third millennium BC Anatolians seem to have been no more able than anyone else to drive horses, much less to ride them. Until ca. 2000 BC we have no evidence for tamed horses in western and central Anatolia, where the Anatolian languages were spoken. When evidence finally appears it indicates that for the Anatolians of ca. 2000 BC the riding and the driving of horses were exciting and challenging novelties. A cylinder sealing from Kültepe shows that at the beginning of the second millennium BC the inhabitants of Kanesh, the very city in which the so-called Hittite language evolved, managed horses not with reins and a bit but with a single line attached to a nose-ring. It is inconceivable that the speakers of the Anatolian languages could have regressed so completely, from competent horsemen ca. 3000 BC to utter greenhorns, unfamiliar with horses, 1000 years later.

Anthony suggests that the Keltic, Italic and Germanic languages were brought into Europe by another folk migration of riders from the steppe. Ca. 3000 BC, that is, the migrators left their Yamna culture between the Dniester and the Dnieper and came into the Danube valley, whence they spread out into central and northern Europe.⁴⁵ In all of these areas the natives adopt the newcomers' language because they admire and emulate the newcomers, who have grown rich as horse-breeders and horse-traders. Anthony suggests that "the annual demand for steppe horses in Late Eneolithic/Early Bronze Age Europe could easily have totaled thousands of animals during the initial expansion of horseback riding beyond the steppes. That would have made some steppe horse dealers wealthy."⁴⁶

Like Gimbutas' original theory, Anthony's founders on the fact that neither on the steppe nor in those areas of Europe supposedly overrun by riders from the steppe do we find evidence that men were riding or even driving horses until ca. 2000 BC, which is also the time at which the earliest demonstrable cheekpieces appear. It is also relevant that until the end of the third millennium BC Near Easterners were not sufficiently impressed by their northern neighbors' riding to import horses for themselves and to learn how to ride them. Nowhere, so far as we know, did any artist depict a person riding a horse, nor did any scribe mention such an act, until shortly before 2000 BC. Through most of the third millennium BC the horse was still a food animal. The relationship between people and horses differed little from the relationship between people and cattle.

The "taming" of horses ca. 2000 BC

Then things changed. From shortly before 2000 BC onward all of the kinds of evidence just listed begin to appear. We begin to have drawings and figurines of—and textual references to—men riding horses or driving them. Grave goods buried with men of substance begin to include horses and spoke-wheeled vehicles. And what are certainly the cheekpieces of organic bits—some found next to the skulls of the horses that once wore them—have been found in late third- and early second-millennium contexts. The conclusion is difficult to escape that late in the third millennium BC the relationship between humans and their horses began to change into what it has remained ever since. At least a few horses were now, in their owners' eyes, far more important than food animals. The ability to travel at the speed of a horse was greatly appreciated and was soon communicated across a wide geographical area.

For the relationship between humans and horses that began at the end of the third millennium BC we have no good word in the modern languages. While *chevalerie* and its derivatives bring to mind medieval knights, terms such as "equestrianism," "equitation," and even "horsemanship" denote accomplished riding, and hardly include the mere ability to control a team of draft horses. A more basic concept comes from the period before secure riding began. In the *Iliad* the chariot-driving Trojans are collectively *hippodamoi*. The Greek word has traditionally been translated "tamers of horses," and the best of the Trojans is "Hektor, tamer of horses." Although the translation is justified, perhaps a better one would be "master of horses."⁴⁷ Hippodameia was the name of various heroines in Greek myth, and the most famous Hippodameia was the bride whom her father offered as a prize to the man who could defeat him in a chariot race (Pelops finally won Hippodameia, by sabotaging the linchpins that held the wheels to the axle of her father's chariot).⁴⁸ In Homeric Greek the compound adjective *hippodamos* combines the noun "horse" with the verbal root *dam-* which denotes controlling, dominating or mastering. A cognate of the Greek *dam-* is the Latin *dom-*, which likewise meant "to subdue" or "to force" (it is the verbal root of the noun *dominus*, and has English derivatives in "domain" and "dominate").

The “domination” or control of a horse probably began not very well: with a nose-ring. In the Near East the nose-ring had long been the conventional device for controlling oxen, donkeys, and onager-donkey hybrids used in draft or as pack animals. By the last quarter of the third millennium BC pastoralists had brought domesticated horses, as food animals, into southern Caucasia, and it is likely that some of these horses also served as pack animals. Evidently the pastoralists, adopting the Near Eastern practice, subjected some of their pack horses to nose-rings and occasionally sat on horses that were being led by escorts on foot. Perhaps daring souls then took the lead-ropes into their own hands and found it exciting to goad a horse into a gallop, the rider being more or less confident that with the rope attached to the nose-ring he could bring the horse to a stop. This was by no means good riding, and accidents must have been frequent, but it would surely have been exhilarating.

In any case, pictorial evidence shows that late in the third millennium BC horses were for the first time brought into Mesopotamia and that they came as riding horses, with rings in their noses. In order to turn the horse in the desired direction the early rider carried a stout stick with which to strike it from the right or the left. Needless to say, while a nose-ring worked well enough with plodding oxen, it must often have panicked a galloping horse, with dire consequences. For more than a century, nevertheless, a few men in the Near East were proud of their ability to ride a horse controlled by a nose-ring and a stick, and they showed it off in plaques and cylinder seals. The earliest two-dimensional representation of a horse and rider comes from Mesopotamia: it is incised on a clay tablet sealed with a cylinder seal belonging to Abbakalla of Ur and dating ca. 2030 BC. The sealing shows a naked (?) man seated on a small horse, of course without a saddle, and with no visible means of control other than a stick that he holds in his left hand.⁴⁹ Three-dimensional representations of horse riders began at almost the same time: the first of the long series of “rider figurines,” clay representations of a man on horseback, with his arms wrapped around the horse’s neck. The representation hardly reflected reality. Roger Moorey plausibly suggested that these were votive figurines, meant to keep the owner safe when on horseback. Hundreds if not thousands of these clay figurines have been found, some in temple deposits. Most of the figurines were mass produced in the first millennium BC, but the earliest—from Tell Selenkahiye in eastern Syria—date between 2200 and 1900 BC.⁵⁰ Mesopotamian riders are also portrayed in low relief on clay plaques from the end of the third and beginning of the second millennium. The riders sit far back, in the “donkey seat,” and are shown controlling their mount with a line attached to a nose-ring. For security the rider on one of the plaques grasps the root of the horse’s tail with one hand, and with the other grasps a surcingle strapped like a cinch belt around the horse’s belly.⁵¹ Much safer enjoyment of the horse’s speed came with draft horses pulling a spoke-wheeled cart, and cylinder sealings found at Kültepe—again displaying horses controlled with lines attached to nose-rings—show that “chariots” were in use there by 1900 BC.

The importing of tamed horses into the Near East required lexical innovations. Two Sumerograms were devised for the horse: ANŠE.KUR.RA, “ass from the

mountains,” and ANŠE.ZI.ZI, “speedy ass.” The Sumerograms first appear in texts from the Ur III period (2112–2004 BC, middle chronology). The name “ass from the mountains” suggests that in central Anatolia, Syria and Mesopotamia horses were brought either from the mountainous land of southern Caucasia or—much less likely—from the eastern foothills of the Zagros.⁵² In one of his vaunts King Šulgi of Ur claimed that he darted from Ur to Nippur as rapidly as an ANŠE.KUR.RA of the god Šakkan, waving its tail as it races on the road.⁵³

Inventions on the steppe

In the Near East, the taming of horses provided sport, entertainment and danger. On the Eurasian steppe, where domesticated horses were everywhere, the taming of horses had much greater consequences. Probably here too the first “free” riding done with at least some confidence may have depended on the rider’s grasping a rope attached to a copper or bronze ring in the nose of a pack horse that was accustomed to carrying a person. However that may be, by ca. 2000 BC some people on the steppe had discovered a much better device with which to control a galloping horse. This was the bit, a mouthpiece placed across the diastemata, the gaps between the horse’s incisors and pre-molars. The mouthpiece was tied to two cheekpieces, each with sharpened points that when tugged against the cheek caused the horse enough discomfort to cause it to turn its head in the desired direction. The bit functioned as a brake when the rider pulled back on the reins, bringing the mouthpiece back against the sensitive corners of the horse’s mouth. The earliest known cheekpieces, carved from bone, have been found in the forest steppe east of the Urals: they would have been connected by a mouthpiece made from leather or some other perishable material. Until evidence to the contrary is found we may suppose that the invention of the bit took place in the forest steppe near the Urals.

It has been argued, however, that bits were first used in the Near East, for controlling donkeys used as draft animals. Although draft equids in Sumer had long been controlled by nose-rings, some specialists believe that by 2200 BC at least a few donkeys in the Jazirah were being controlled by copper or bronze bits. At Tell Brak, in the upper Habur area of eastern Syria, archaeologists in 1992 discovered the skeletons of five donkeys near the foundations of a small temple.⁵⁴ The donkeys had been sacrificed, ca. 2200 BC, to the god Šakkan, who preferred donkeys to other sacrificial animals. The pre-molars of the donkeys were worn, and on three of the donkey skulls the pre-molars were stained blue-green. Juliette Clutton-Brock and Sophie Davies concluded that “the donkeys were bridled with bits made of copper or bronze.” With some hesitation Mary Littauer and Joost Crouwel accepted the conclusion, noting that such blue-green stains were unparalleled.⁵⁵

If Clutton-Brock and Davies were correct about the teeth from Tell Brak, the donkeys were very likely used as draft animals, pulling the heavy disk-wheeled carts that were fairly common at Tell Brak and other sites in Syria and Mesopotamia.⁵⁶ We would then conclude that the bit was originally devised for

directional control of draft donkeys in the Near East.⁵⁷ Nose-rings, however, were evidently still in use in the Near East 300 years after the sacrifice of the Tell Brak donkeys, and the first clear evidence for a bitted donkey (from Tel Haror in Israel) dates to ca. 1650 BC.⁵⁸ Otherwise, donkeys are shown controlled by nose-rings, nose-bands, or neck-ropes. We must conclude either that the blue-green stains at Tell Brak ca. 2200 BC resulted from something other than metal bits, or that a metal mouthpiece was a brief experiment at Tell Brak and initiated no tradition. Philip Kohl's Leif Erikson analogy is pertinent again.

In the horse country of the steppe, in contrast, the invention of the organic bit ca. 2000 BC not only would have given riders much more control than was possible with a nose-ring and rope, but also encouraged the invention of a light, spoke-wheeled cart. At this point in the evolution of horsemanship, driving a team of draft horses was considerably less problematic than riding a horse. Riders in the second millennium BC are consistently portrayed as sitting not up near the withers but far back: behind the horse's rib cage, in what is often called the "donkey seat" (because donkeys have very low withers, and can easily pitch a rider forward, riders tended to sit closer to the donkey's rear). Such a seat on horseback, as characterized by Littauer and Crouwel, reflected "a still primitive stage of equitation."⁵⁹ I have suggested elsewhere that so awkward a seat was preferred by riders in the Middle and Late Bronze Age because they feared for their lives if their mount took the mouthpiece between its teeth and ran out of control: in such an emergency, the rider may have regarded ejection from the horse's rump as his only possible salvation. The adoption of a "proper" seat in the Iron Age, then, was made possible by the jointed snaffle bit, which put the mount firmly under the rider's control.⁶⁰

Because riding was insecure, the chariot was essential in exploiting the tamed horse's speed. Only recently has it been recognized how important was the forest steppe in the development of the chariot,⁶¹ and much of the credit for this recognition goes to Vladimir Gening, Nikolai Vinogradov and David Anthony. Until late in the 1970s the only direct evidence for chariots on the steppe were crude petroglyphs of horses pulling chariots. These rock carvings were hardly dateable, and the assumption was widespread that the chariot made its way to the steppe well after it had been invented in the Near East. Now archaeologists have found traces of chariots in steppe graves—at least sixteen according to Anthony—dated early in the second millennium BC.⁶² Mary Littauer and Joost Crouwel, who contributed so much to the study of wheeled vehicles and ridden animals in the Bronze Age, responded to the discovery of the evidence in the steppe by reaffirming their earlier argument that the first chariots were built in the Near East.⁶³ Their reaffirmation, however, depended on the assumption (shared by Anthony) that since the Neolithic period horses had been routinely ridden on the steppe, while in the Near East the only ridden animals were the donkey and—perhaps—the onager. Why, Littauer and Crouwel asked, would a steppe dweller have desired a chariot when his riding horse gave him a much superior mode of transportation? The chariot was expensive, was slower than a mount, was far less maneuverable, and was very liable to damage. These observations are entirely

correct, of course, but instead of weakening the thesis that the chariot appeared first on the steppe they strengthen a very different conclusion: that everywhere—on the steppe as well as in the Near East—the safe and effective riding of horses followed rather than preceded the driving of horses.

The earliest known artifacts that are certainly cheekpieces were found in conjunction with the earliest known spoke-wheeled carts. The innovations seem to have occurred together in the Sintashta-Petrovka cultural area, along the eastern flank of the southern Urals.⁶⁴ In the late 1980s Nikolai Vinogradov, excavating at Krivoe Ozero in the Chelyabinsk Oblast, found four cheekpieces next to two horse skulls. This was a “chariot burial”: a burial, that is, of a man accompanied to the Underworld by a team of draft horses and by a cart with two spoked wheels. Although the cart itself was not preserved, traces in the soil indicated that it had wheels with many spokes. If the vehicle was built to accommodate a sitting rather than a standing passenger, if the box opened toward the front rather than the back, and if the axle was positioned in the center of the box rather than toward the rear, the word “chariot” would not quite be appropriate for it. Although the Krivoe Ozero vehicle was undoubtedly ancestral to the chariot, we may more cautiously call it a spoke-wheeled cart.⁶⁵ Whatever we call it, it clearly was meant for speed rather than for hauling cargo: drawn by a team of running horses, the cart and its occupant could probably have reached the breathtaking speed of 25 miles per hour.⁶⁶

In 1992 Vinogradov gave Anthony permission to date bone from the two Krivoe Ozero horse skulls and the calibrated date turned out to be 2270–2030 BC (the uncalibrated dates were about 300 years later).⁶⁷ The Krivoe Ozero “chariot burial” was not an isolated phenomenon. In the 1970s Vladimir Gening had excavated five similar burials at Sintashta, 80 miles to the south of Krivoe Ozero. Traces in the ground showed that the Sintashta carts, like the one buried at Krivoe Ozero, had many spokes: at least eight, and in one case twelve. Although Gening originally assigned the spoke-wheeled vehicles at Sintashta to the seventeenth century BC carbon dating has put them considerably earlier, and close to 2000 BC.⁶⁸ They were found not under a kurgan but in an ordinary cemetery at Sintashta (SM). Anthony well expresses, however, how extraordinary were the grave goods in that cemetery. In addition to the spoke-wheeled carts, “the forty SM graves contained astounding sacrifices that included whole horses, up to eight in and on a single grave.”⁶⁹

The cheekpieces found in the burials at Krivoe Ozero were disk-shaped and were made from bone. These *Scheibenknebel* were necessarily connected by an organic mouthpiece, perhaps cord or leather, which has disappeared. Ideally, the driver could stop or brake a horse by pulling back on the reins, thereby pulling the mouthpiece back against the sensitive corners of the horse’s mouth. In practice, however, a horse would often work the mouthpiece back from the diastemata to the pre-molars, clamp them down, and so immobilize the mouthpiece. The cheekpieces were carved with studs protruding from the inner face.

The same design was followed in the bronze “Hyksos” bits used in the Near East from ca. 1700 until at least 1300 BC. Littauer and Crouwel described the studded bronze cheekpieces as appropriate for “driving bits, with the emphasis

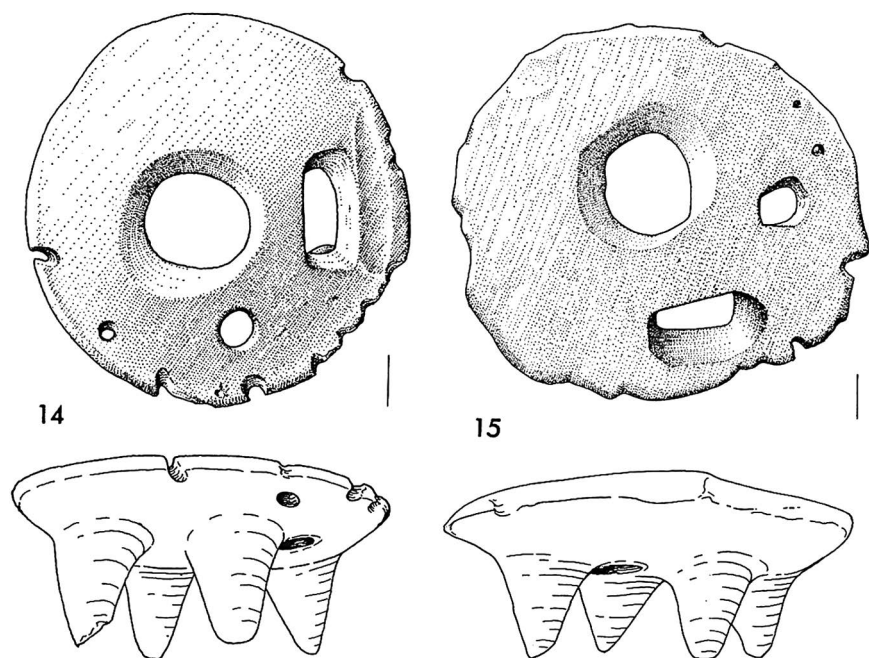


Figure 2.1 Disk cheekpieces (*Scheibenknebel*) from Trakhtemyriv, on middle Dnieper. From Hüttel 1981, nos. 14 and 15. Courtesy *Prähistorische Bronzefunde* and C. H. Beck Verlag

on enforcing directional control from a vehicle (i.e. from a distance behind the horses' mouths)—something that is much less difficult from the back of a mount.⁷⁰

The introduction of the bit enabled steppe dwellers to use as draft animals the horses that until then had been valued mostly as food animals and secondarily as pack animals. Horses hitched to wagons or to disk-wheeled carts would have hardly been able to run, and if they did work up to a run with a heavy cart behind them they would have had difficulty bringing it to a stop. Once the bit was available, therefore, some effort and experimentation must have gone into constructing a light, spoke-wheeled cart. The spoked wheel weighed only a fraction of the disk wheel, whether the disk was tripartite or (rarely) solid. If the cart's platform was of leather rather than of planking the cart would have weighed so little that a team of horses, each pulling against a neck-strap, could have pulled it with ease and could as easily have stopped it when reined in.

In the Sintashta-Petrovka region of the steppe, the first spoke-wheeled carts appear—how could it be otherwise?—in funerary contexts. The cart and the horses that pulled it may have carried the body to the burial site, and certainly accompanied the deceased owner into the Underworld. Karlene Jones-Bley has argued that the Sintashta “chariots” were not designed for more practical purposes (many,

but not all, had a wheel gauge somewhat narrower than that of chariots in the Late Bronze Age) and served only as vehicles destined for the Underworld.⁷¹ That the carts had no practical utility in the world of the living, however, is difficult to accept. Like the other goods placed in the grave, the horses and “chariot” should have been of some service or value to the deceased during his lifetime. Stated another way, if a rich man had not driven the “chariot” for rapid transport during his lifetime the mourners would not have done him much of a favor by sending it (and a team of horses) along with him to the Underworld.

Essential for building a light cart was the steam-bending of wood. Most obviously, the felloes that rimmed the wheels had to be bent in order to form a circle. How much more steam-bending was done for the spoke-wheeled carts at Krivoe Ozero and Sintashta is unknown. In the Late Bronze Age steam-bending was required to produce the spokes, the yoke, and even—most difficult of all—the yoke-pole. The art of steam-bending wood had long been known: shafts of arrows had been steam-straightened already in the Neolithic period, and in Egypt wood was being steam-bent for various purposes by the end of the Fifth Dynasty (so ca. 2400 BC).⁷² The technical aspects of bending wood for a chariot have been recently and vividly illustrated in a television documentary produced by Martin O’Collins.⁷³

Organic bits of the kind used in the Sintashta-Petrovka culture soon became widespread on the steppe. Studded disk cheekpieces, closely resembling those from Sintashta, have recently been found in Tajikistan, some 1300 miles southeast of Sintashta.⁷⁴ Importantly for our purposes, bits of the same kind have been found in Romania and—as now is well known⁷⁵—two pairs were also included in the corrodo of Shaft Grave IV at Mycenae. Most of the early specimens that have been recovered, usually from burials, come from the Sintashta cultural area westward to the forest steppe along the upper Don.⁷⁶ That the bit and the spoke-wheeled cart were soon adopted over so vast an area on the steppe indicates how important and exciting these innovations were in the horse’s natural habitat. The building of a spoke-wheeled cart of course required long labor and skilled craftsmanship, and although horses may have been cheap a chariot was not. In the second millennium BC the average man on the steppe may have been well acquainted with chariots but did not own one. In the SM cemetery at Sintashta were forty graves, of which seven included a “chariot” burial,⁷⁷ and even that percentage may be misleadingly high. From the entire steppe only several dozen cheekpieces have been discovered in Bronze Age contexts.

The chariot for recreation and display in the Near East

The first tamed horses in the Near East seem to have been ridden—without a saddle, and controlled only by a line attached to a nose-ring—and driving was much safer than riding. Spoke-wheeled vehicles had come into use in at least parts of the Near East by the nineteenth century BC, and initially the draft horses too were controlled with nose-rings rather than with bits. The earliest depictions of draft horses show them pulling a proper chariot, the driver standing rather than sitting.⁷⁸ A sealing

recovered from Level II of the Kanesh Karum at Kültepe depicts a man standing in his spoke-wheeled chariot and grasping two lines leading to the nose-rings of the two animals drawing the chariot. The animals are presumably meant to be horses, although the engraver was not very successful in rendering them. Level II of the *karum* was destroyed and deserted ca. 1835 BC, the terminus ante quem for the sealing.⁷⁹ Another early sealing from Anatolia presents a similar scene, a driver standing in a chariot and holding two lines attached to nose-rings of the draft horses. Later illustrations of horses controlled by nose-rings have not been found, and we may assume that by the end of the nineteenth century BC drivers of chariots in the Near East had replaced the nose-ring and single line with a bit and reins.

Although in Mesopotamia and the Levant horses were not yet of any military utility in the Age of Hammurabi (ruled 1792–1750, middle chronology) they were prized possessions of royalty. Here their ritual role is doubtful: a non-traditional animal in the Near East, the horse was not yet sacred to any of the Near Eastern gods. Horses and chariots were apparently sought for racing and other recreation, and for display. The prestige value of horses in the Age of Hammurabi is well documented by Akkadian tablets found at Mari, on the middle Euphrates, and at Chagar Bazar, in the northeastern corner of Syria. The Chagar Bazar tablets were inscribed when Shamshi-Adad I ruled as Great King at Shubat-Enlil (1813–1781 BC) and his younger and somewhat incompetent son Yasmah-Adad was a petty king of cities from Mari north to Chagar Bazar and Tell Brak on tributaries of the upper Habur. The Mari tablets date during the reign of Zimri-Lim, who wrested Mari away from Yasmah-Adad, but are no later than 1759 BC, when Mari was destroyed by Hammurabi of Babylon. According to the tablets from Chagar Bazar, for pulling chariots the palace owned twenty horses, grouped in two- or three-horse teams. As summarized by Roger Moorey, the texts,

refer to harnessed teams of horses, to grooms and to trainers, but they do not make the role of the horses explicit. About the same time at Mari the information is fuller. Here, horses were prized animals. The royal family was involved in breeding and training them; their management was controlled and effective.⁸⁰

During the Age of Hammurabi royalty in the Near East certainly sought horses and chariots for display and promenade. In one of his letters Shamshi-Adad instructs Yasmah-Adad to dispatch a team of horses and a chariot to Ashur, so that Shamshi-Adad can parade in the chariot at the New Year's festival. In an exchange of letters with Aplahanda of Carchemish, Zimri-Lim at Mari requests a team of white chariot horses, but must settle for bays.⁸¹ In yet another letter Bahdi-Lim, the major domo of the palace at Mari, urges Zimri-Lim to drive a chariot when he visits the more sophisticated Akkadian cities to the south. To ride on the back of a horse is not befitting the dignity of a king, Bahdi-Lim advises: if Zimri-Lim is intent on riding rather than on driving, let him ride a mule rather than a horse, but driving a chariot is best of all.⁸²

The chariot in hunting

Much more important than display or recreation was hunting.⁸³ Archers in horse-drawn chariots could move swiftly enough to hunt prey that was too fast or predators and wild boars that were too dangerous to approach on foot. Having nothing to fear from wild animals, we forget how wary people necessarily were of the great predators before the chariot age. Early in the second millennium BC lions were apparently a danger to flocks and herds not only over all of the Near East, but even—as has recently been discovered—in Greece, the Balkans and the Ukrainian steppe.⁸⁴ With the advent of the chariot men could for the first time go into the wilderness in pursuit of these and other predators. Although in doing so they still risked their lives, as well as their horses, if they returned with a trophy the men would be greeted as heroes.⁸⁵ Even one man could with some difficulty and much practice both drive the chariot and handle a bow. In the earliest known representation of a chariot in a hunting scene, on a cylinder seal from Syria, the driver of a chariot has tied the reins around his waist and is drawing his bow.⁸⁶

Almost from the beginning of the second millennium BC men on the steppe must have hunted—whether prey, steppe wolves, or an occasional lion—from the spoke-wheeled carts attested along the southern Urals. In Grave 30 at Sintashta the “chariot” burial includes a knife, a socketed bronze spearhead and an array of stone arrowheads.⁸⁷ Although one man in a chariot may have been a successful hunter, a more effective strategy was to expand the chariot box so that two men could stand side-by-side on the leather straps that formed the car’s platform, one man driving while the second handled the bow. The engraved gold signet-ring that Schliemann found in Shaft Grave IV at Mycenae portrays two men in a chariot hunting a stag. A very similar configuration appears in bronze models found in southern Caucasia.⁸⁸

The chariot in raids, rustling and war

The archer’s skill required for hunting animals from a chariot could obviously be used just as effectively against humans. In the Near East references to chariots in war become significant only ca. 1640 BC, with the reign of Hattushili I in Hatti. Relatively few texts, however, have been recovered from the century prior to Hattushili’s reign, and one of these—the “Anitta Text”—indicates that in central Anatolia chariots had begun to play a military role already ca. 1750 BC. In Chapter 4 we will take a closer look at the Anitta Text and the beginnings of chariot warfare in the Near East.

On the steppe chariots were probably used against men well before they were so used in Anatolia or anywhere else in the Near East. The most visible and valuable commodity on the steppe was livestock, and archers in chariots would have had no difficulty in driving off or killing shepherds or herdsmen and stealing their livestock. There is some reason to think that this is what happened: as will be seen in Chapter 3, very soon after the invention of the chariot nomadic pastoralism in the steppe seems to have become less attractive. The Yamna culture, from which very few settlements

have been found, was followed—after 2000 BC—by archaeological cultures characterized by numerous permanent settlements. In the Srubna, the KMK and the Sintashta cultures a large part of the population evidently preferred to live in communities of huts and houses rather than in wagons on the open steppe.

The improvement of riding ca. 1000 BC

Shooting an arrow from horseback, in contrast to shooting an arrow from a chariot, was evidently not yet safe or successful in the second quarter of the second millennium BC. Although by the end of that millennium a few riders may have been hunting on horseback, the earliest such representation, so far as I know, appears on a limestone altar at Gordion. The altar apparently dates toward the end of the ninth century BC.⁸⁹ Mounted hunting, however, must have been widespread even at the beginning of the ninth century, because in the reign of Ashurnasirpal II (889–853 BC) mounted combat had already begun: our earliest portrayals of such combat come from Assyrian reliefs at Kalhu and at nearby Balawat.⁹⁰ It should be noted, however, that in the ninth century BC a mounted archer in the Assyrian army seems to have required an escort, who held the reins of the archer's horse while the archer drew his bow. Riders in Iran and on the Eurasian steppe were undoubtedly more competent than their Assyrian contemporaries, but even in the horse country it is unlikely that hunting from horseback began much before 1000 BC.

Riding became more secure in the first millennium BC than it had been in the second, thanks to improvements in the material and design of the bit.⁹¹ On the steppe organic bits remained in use until after 1000 BC, and a horse could neutralize an organic bit by clamping its pre-molars down on the rope or leather mouthpiece. An additional disadvantage of the organic bit was the fragility of the mouthpiece: sooner or later a horse that persistently chewed on the mouthpiece would sever it. The liabilities of an organic bit would not often have been disastrous for the driver of a team of draft horses, because two horses would not often have taken the bits between their teeth at the same moment. A ridden horse, however, may frequently have been intractable.

Throughout the Late Bronze Age chariots in the Near East were primarily used in battle, and in the clamor and chaos of a battlefield a charioteer needed something more dependable than an organic bit. Except in Anatolia, where organic bits continued to be used during the Hittite Old Kingdom and well into the Hittite Empire,⁹² chariot horses in the Near East were bridled with metal bits. In the so-called "Hyksos" bit, recently shown to have been in use already by the middle of the seventeenth century BC,⁹³ a straight bronze bar connected two bronze cheekpieces (the inner faces of the cheekpieces were studded). Although sturdy enough this bit too was problematic, especially for a rider, because a horse could take the bronze bar between its teeth and prevent the rider either from pulling back the mouthpiece into the sensitive cheek tissue or from tugging one or the other of the cheekpieces. Much more security came with the jointed bronze snaffle bit, which first appeared in Egypt, the Fertile Crescent and the Aegean in the fourteenth century BC. The new bit foiled the horse's inclination to take the

mouthpiece between its teeth: if the horse clamped down on the ends of the jointed canons it pushed the joint up into the roof of its mouth, an unpleasant and painful sensation.

Anatolian chariot drivers were slow to adopt the jointed snaffle, although early examples have been found in southern Caucasia, and the earliest examples in temperate Europe may not be earlier than 1000 BC.⁹⁴ Apparently it reached the Eurasian steppe at about the same time, and in this horse country it was revolutionary. On the steppe very few bits are attested for the second millennium BC, but a great many for the first. In Hüttel's catalogue fewer than thirty bits are attested for the steppe in the period ending with the tenth century BC, and none of them are metal.⁹⁵ For the next three centuries, in contrast, Ute-Louise Dietz catalogued from the same region 645 bits, 90 percent of them either bronze or iron and most of these jointed snaffles.⁹⁶ From the "Skythian period" of the steppe hundreds of iron jointed snaffles, most of them badly oxidized, have been recovered but never published. My conservative estimate was that for every bit from the steppe attested for the second millennium BC we have fifty from the first millennium BC.⁹⁷

On the steppe the use of a jointed snaffle bit spread quickly both east and west, and secure horseback riding spread with it: Iron Age riders sat forward, close to the withers. The jointed snaffle bit contributed to the transition of steppe society from the coexistence of settled and nomadic communities to unmixed nomadism.⁹⁸ By 700 BC the jointed snaffle—whether of bronze or of iron—was the standard bit from the Rhine river to the Altai mountains, and it remains the standard over most of the world today. Soon after they became good riders, men on the steppe learned how to draw a bow on horseback and the consequences were of historic importance. In Barton Hacker's summary, "archers on horseback were something new—and transformative. Horse archery and equestrian techniques spread quickly and widely through the steppes, as did the full-blown pastoral nomadism with which they were closely associated."⁹⁹

Gimbutas' thesis that men in the Eurasian steppe were good riders already in the fifth and fourth millennia BC fails on several grounds, and its survival now depends on Anthony's interpretation of the beveling of seven horse pre-molars from Neolithic sites in northern Kazakhstan. Both Gimbutas' original thesis and the revision of it come up against not only the most direct archaeological evidence for bridling components but also a wide variety of historical evidence—from the documented world of the Near East—that both the driving and the awkward riding of horses began shortly before 2000 BC, and that men did not become good riders until ca. 1000 BC. The most recent argument that driving preceded good riding on the steppe we owe in part to Anthony's own initiative. We now know, thanks to the carbon dates from Krivoe Ozero, that light, spoke-wheeled carts drawn by horses were built east of the Urals ca. 2000 BC, and that these proto-chariots soon spread through the steppe as far west as the upper Dnieper.

Because the prehistory of the steppe is by definition undocumented by written records, and is rarely illustrated in pictorial evidence, it is unusually pliable and open to diverse reconstructions. We are fortunate that on the subject of "the taming of horses" our ample archaeological evidence from the steppe is supplemented

by historical evidence from the Near East. Our evidence is sufficient to conclude that Europe was not Indo-Europeanized in the fifth, fourth or third millennium BC by riders from the steppe.

Notes

- 1 See Drews 1988, p. 119: Throughout the 2nd millennium BC, “the typical steppe warrior was the mounted archer.”
- 2 Potratz 1939. For his dissertation Potratz had provided a translation of, and commentary upon, Kikkuli’s treatise on the care and training of chariot horses. Potratz published an expanded version of that work, including other Hittite texts dealing with horses, as *Das Pferd in der Frühzeit* (Rostock: Hinstorff, 1938).
- 3 Hermes 1935–1936.
- 4 Wiesner’s *Fahren und Reiten* was originally published in 1939, as fascicles 2–4 of *Das alte Orient*, Bd. 38. In 1971 Georg Olms reprinted it as a book.
- 5 For the English translation of Telegin’s findings see Telegin 1986.
- 6 Anthony and Brown 2000, p. 75.
- 7 On the tines from Dereivka and elsewhere see Drews 2004, pp. 15–19 and Figs. 2.2 and 2.4.
- 8 Already in her early publications Gimbutas urged her Kurgan theory, but dated the conquest of Europe in the late 3rd millennium BC. See Gimbutas 1963b, p. 834:

The invasion (or several waves of invasion) most likely occurred in the period between 2400 and 2200. This time interval is indicated by Carbon 14 dates for the early Kurgan graves and corded pottery and by the dates for the destruction layers of Troy II, Beycesultan XIII and Early Helladic II Lerna.

Other considerations, including calibration of carbon dates, persuaded Gimbutas to raise her chronology by two millennia, but without changing the theory. When the 1963 article was reprinted in the 1997 Gimbutas collection the new chronology was simply inserted:

The invasion (or several waves of invasion) most likely occurred in the period between 4400 and 4200. This time interval is indicated by carbon-14 dates for the early Kurgan graves and corded pottery and by the dates for the destruction layers of Troy II, Beycesultan XIII and Early Helladic II Lerna.

See Gimbutas 1997b, p. 30. The destruction layers of course still date to the late 3rd millennium.

- 9 Fortson 2004, p. 41.
- 10 Hančar 1956. At p. 561 Hančar dated the beginning of good riding on the steppe and elsewhere “rund 800 v. Chr.” and saw it as a result of the improvement of the bit.
- 11 Renfrew 1987, pp. 137–139; Levine 1990; Häusler 1981, 1982 and 1996.
- 12 For English versions of her views see Kuzmina 2000 and Kuz’mina 2007. Her Russian publications along the same lines began in the early 1970s.
- 13 Drews 2004.
- 14 Fortson 2004, p. 41.
- 15 Anthony 2007, pp. 18 and 223–224, suggests that the main reason for the riders’ absence in Bronze Age battles is that until ca. 1000 BC bows were too long and clumsy for a rider to handle. See also Anthony and Brown 2011, pp. 154–156. Although many of the ideas in Anthony’s 2007 book had been advanced in his seminal article in *Current Anthropology* (Anthony 1986), the book only briefly mentions (as at p. 222) the analogy between the Neolithic riders in the north Pontic steppe and the 17th- and 18th-century Native American riders. In the 1986 article this “American model,” with Plains

Indian warriors (Sioux, Comanche, Apache) riding horses in battle, had been important for the argument that the domesticated horse transformed Neolithic society north of the Black Sea.

16 Anthony 2007, p. 340.

17 Anthony 2007, p. 344.

18 Kortlandt 2010, p. 3.

19 Fortson 2004, p. 42.

20 See Fortson 2004, pp. 43–44:

[T]he archaeological prehistory of all the European IE groups is quite murky. But in the period 3100–2900 BC came a clear and dramatic infusion of Yamna cultural practices, including burials, into eastern Hungary and along the lower Danube. With this we seem able to witness the beginnings of the Indo-Europeanization of Europe.

21 Fortson 2004, p. 43.

22 Anthony 2007, p. 217, puts the percentage at 99.9 percent.

23 Levine 2005, p. 14.

24 Outram et al. 2009.

25 On Dereivka see Levine 1990, pp. 727–740; Drews 2004, pp. 12–15; Anthony 2007, pp. 205–206.

26 For the advantages of the horse over the other domesticates, especially in snowy winters, see Kelekna 2009, pp. 39–40.

27 Anthony 2007, pp. 184–185.

28 Sherratt 1981 and Sherratt 1983.

29 In his “Transport in Ancient Egypt” Robert Partridge writes, “It is a curious fact that one of the greatest civilizations in the world flourished without the use of wheeled vehicles until the introduction of the chariot relatively late in Egyptian history.” See Partridge 2010, p. 380.

30 Rossel et al. 2008, p. 3719: The study showed that the Abydos animals had close skeletal similarities to the Nubian wild ass, indicating an early stage of evolution.

But the context of and the skeletal pathologies on the Abydos animals are consistent with confinement and prolonged use for heavy transport. All Abydos long bones show abrasion of cartilage, osteophyte formation along the margins of the articulate surfaces, and scouring of the joint surface consistent with wear resulting from transport of heavy loads.

31 Epstein 1985, p. 59 and Figs. 9, 10 and 11.

32 Bendukidze 2010.

33 On this see Way 2010. This article is a summary of Way’s doctoral dissertation (2006) at Hebrew Union College in Cincinnati.

34 On PIE **ékwo-* see Sergent 1995, p. 174: “On a reconnu dans son nom une épithète, ‘le rapide.’”

35 Anthony 2007, p. 221: “Over the long term it would have been very difficult to manage horse herds without riding them.” For other scholars’ assumption that domesticated horses needed a mounted herder see Drews 2004, pp. 20–24.

36 Gimbutas 1970, p. 158.

37 Anthony 2007, pp. 206–213 and p. 220.

38 See Frachetti and Benecke 2009, and especially the authors’ generalization at pp. 1025–1026:

Significantly, faunal data from Begash contradict the notion that the emergence of Eurasian pastoralism was sparked by the rapid domestication and riding of the horse. In the eastern steppe, at least, horse use seems to commence gradually and is not highly associated with early and middle Bronze Age pastoralists. Instead,

the evidence from Begash suggests that the key species within Eurasian pastoralist economies started with *and remained* sheep/goat and cattle, as early as 2500 BC. Thus horse riding—whenever it actually began—was not essential to successful herd management during the early to middle Bronze Age and did not have dramatic and immediate political, social and military consequences in the formative stages of Eurasian pastoralism.

At p. 1036 Frachetti and Benecke conclude that:

the zoological record from Begash illustrates that the increase in horses through time correlates first with opportunistic hunting forays at the end of the Bronze Age and then with expanding political engagements that undoubtedly reshaped the organisation of Eurasian pastoralist communities from the first millennium BC onward.

- 39 Drews 2004, p. 167, n. 101.
- 40 Kohl 2007, p. 140.
- 41 Anthony 2007, p. 239.
- 42 Anthony 2007, p. 251.
- 43 Anthony 2007, p. 262. Anthony and Ringe 2015 propose that a folk migration ca. 4000 BC brought Proto-Anatolian speakers down from the steppe into Anatolia. Because the Anatolian languages did not inherit the PIE terms for wheeled vehicles, it is necessary somehow to separate the Anatolian languages from the “other” IE languages before the invention of wheeled vehicles. As we have seen in Chapter 1, there is no evidence—either linguistic or archaeological—for a migration into Anatolia from the steppe, while there is plenty of evidence for a continuous trickle of colonists going the other way early in the Neolithic period.
- 44 Drews 2004, pp. 12 and 25. See Fig. 4.6 (p. 137) in Harding 2000 for percentages of animal bones found at central European sites.
- 45 Anthony 2007, p. 344. See also the map at p. 345, with arrows showing the direction of the folk migrations. In her Kurgan theory Gimbutas had reduced the role of folk migrations, proposing instead a subjugation or “kurganizing” of the indigenous Europeans by conquerors on horseback from the steppe.
- 46 Anthony 2007, p. 341.
- 47 In their translations of the *Iliad* Richmond Lattimore and Robert Fagles chose to render the epithet *hippodamos* as “breaker of horses.” In 1898 Samuel Butler had rendered it as “tamer of horses,” as had Lang, Leaf and Myers 15 years earlier. This was etymologically justified, because “tame,” from Old English *tam*, derives ultimately from Proto-Indo-European *deme*, which is also the source of the Greek *dam*- and the Latin *dom*-. In modern usage, however, “taming” denotes a completed action, as does “breaking,” whereas *hippodamos* suggests a continuing relationship between the master and his horses. In the Homeric epics *hippodamos* denoted a man who controlled horses under the yoke.
- 48 On the origins of the myth see Hansen 2000.
- 49 Drews 2004, pp. 32–33 with Fig. 3.2.
- 50 Drews 2004, pp. 32–36, with Figs. 3.3 and 3.4.
- 51 Drews 2004, Figs. 3.6 and 3.7.
- 52 On the rarity of horses, whether wild or domesticated, in the Zagros see Potts 2014, pp. 48–53.
- 53 Drews 2004, p. 40 and p. 161, n. 28.
- 54 Clutton-Brock and Davies 1993.
- 55 See Littauer and Crowel 2001, p. 331:

It could be argued that copper/bronze bits would not have discoloured the teeth. Since no similar stains have been found on the teeth of other animals that would

have worn such bits, one can only suggest that something in the grass or soil (or simply the salt which is necessary to every herbivore's diet) available to those donkeys would have reacted chemically with their bits.

56 For clay models of carts and wagons found at Tell Brak see Fig. 8 in Clutton-Brock and Davies 1993.

57 So argued by Littauer and Crouwel 2001.

58 In reporting the copper bit found in a donkey's skull at Tel Haror, Bar-Oz et al. 2013 state that "harnessing of a donkey with a bridling system was so far unknown."

59 Littauer and Crouwel 1979, p. 96.

60 Drews 2004, pp. 85–86.

61 See Epimachov and Korjakova 2004, p. 221: "Stichhaltige Belege für den bronzezeitlichen eurasischen Streitwagen gibt es erst zeit relative kurzer Zeit. In den 1970er Jahren stiess man in den Gräberfeldern von Sintashta erstmals auf Funde (Gening 1977), die diese Bestandteile in verschiedenen Kombinationen aufwiesen."

62 See Anthony 2007, p. 397:

There is disagreement as to the number of clearly identified chariot graves because the spoke imprints are faint, but even the conservative estimate yields sixteen chariot graves in nine cemeteries. All belonged to either the Sintashta culture in the Ural-Tobol steppes or the Petrovka culture east of Sintashta to northern Kazakhstan. Petrovka was contemporary with late Sintashta, perhaps 1900–1750 BC, and developed directly from it.

63 Littauer and Crouwel 1996a. For their earlier argument that the chariot was a Near Eastern invention, and was not brought into the Near East from the steppe, see Littauer and Crouwel 1979, pp. 68–71. Although Crouwel and Raulwing have carried on Littauer's advocacy of a Near Eastern origin of the chariot, other scholars have proselytized to the steppe. In his early years Wolfram Nagel published a monograph arguing that the Near Eastern chariot evolved locally, but in a long article in 2006 Nagel argued that "der klassische Streitwagen" came from the southern Urals. Compare Nagel 1966 with Eder and Nagel 2006. Harding 2005 recognized that the chariots belonging to the Shaft Grave Mycenaeans seem to have come not from the Near East but from the forest steppe.

64 Kuz'mina 2007, pp. 115–131, provides the most exhaustive description, typology and tabulation of the organic cheekpieces from the steppe and from Mycenaean Greece.

65 Karlene Jones-Bley prefers to call these Sintashta vehicles "carts" rather than "chariots." She is probably right that they were too unwieldy to have been of military value, and she may be right that those found in the graves had somehow been used to transport (sitting?) corpses to the graves. It is unlikely, however, that the carts were built only to serve as hearses: the people of ancient Sintashta were surely imaginative enough to see that a rapidly moving cart could be of some use or entertainment for the living. Nor can I agree with Jones-Bley that the Sintashta vehicles were not the ancestors of chariots but were "imitations of vehicles found in the Near East" (Jones-Bley 2000, p. 139).

66 Herold 2004, pp. 138–139, on the basis of the chariot reconstructed at Hildesheim, estimated that in New Kingdom Egypt a chariot could be driven at a speed between 25–30 km/h without any problem. As for the top speed, estimating the horsepower and the weight of the vehicle and two passengers, "dann mögen 30–40 km/h für ein ägyptisches Streitwagensgespann auch über längere Distanzen gar nicht so unwahrscheinlich sein."

67 See Anthony and Vinogradov 1995; and Anthony 2007 p. 500, note 2.

68 On the widely varying carbon dates from various Sintashta kurgans and cemeteries see Anthony 2007, pp. 374–375 and his Table 15.1 on pp. 376–377. See also Kuznetsov

- 2006, pp. 643–644, on the basis of seventeen radiocarbon dates of chariot burials in the southern Urals: The emergence of chariots “dates at latest from the second half of the twentieth century BCE and the chariot burial rite of Potapovo-Sintashta type continued to flourish at least until the beginning of the eighteenth century BCE.”
- 69 Anthony 2007, p. 372.
- 70 Littauer and Crouwel 2001, pp. 329–330, describing the similarly studded “Hyksos” bits used for paired draft in the Near East until ca. 1400 BC.
- 71 Jones-Bley 2000.
- 72 For steam-bending in ancient Egypt see Herold 2004, pp. 133 ff. (“Bugholzkunst am Nil”).
- 73 O’Collins 2013. The television program, “Building Pharaoh’s Chariot,” aired on February 6, 2013.
- 74 Bobomullov 1997. See also Parpola 2004–2005, p. 4.
- 75 For a long time Aegeanists could only guess at the utility of these disk-shaped objects. See, for example, Alan Wace’s “A Mycenaean Mystery” (Wace 1960).
- 76 For maps showing distribution of disk-shaped and studded cheekpieces carved from bone or antler see Hüttel 1981, Taf. 24 and 26A; Penner 1998, Tafeln 15, 16 and 17; Boroffka 1998, Abb. 12–17; Priakhin and Besedin 1999, Fig. 1, and Kohl 2007 Fig. 4.9 (p. 145). See also Kuz’mina 2007, pp. 115–116. On Kohl’s map (adapted from a 1999 map made by Mike Teufer) and Priakhin and Besedin’s map note the many find-spots of *Scheibenknebel* on the upper Don.
- 77 On the SM cemetery at Sintashta see Anthony 2007, pp. 372–373.
- 78 Drews 1988, Figs. 6 and 7, reproducing the drawings in Littauer and Crouwel, 1979, Figs. 28 and 29.
- 79 On the date of Level II of the *karum* and on the “wealth of impressions of Old Assyrian cylinder seals” found at the site see Veenhof and Eidem 2008, p. 20.
- 80 Moorey 1986, p. 198.
- 81 Drews 1988, p. 99.
- 82 For J. R. Kupper’s translation of the text see Drews 2004, pp. 48–49.
- 83 On the role of the hunter in Neolithic and Bronze Age societies see Hamilakis 2003.
- 84 On the finding of lion bones in Greece see Thomas 2004, p. 162:

Since 1978, the remains of *Panthera leo* have been found on nine mainland or island sites in contexts dating from the Late Neolithic through the Archaic periods. These finds, together with the newly published lion bones from nineteen Balkan/Ukrainian sites of Neolithic to Iron Age date, document the presence of the lion in the Balkan peninsula from the 5th to the 1st millennium B.C. These bones, which redirect us from artistic imagination to real-life experience, have barely begun to be incorporated into Mycenaean lion studies.

- 85 Thomas 1999, p. 305: “[H]unter was the most popular masculine power metaphor in all Late Helladic art.”
- 86 Littauer and Crouwel 1979, p. 63 and Fig. 36.
- 87 For illustration see Epimachov and Korjakova 2004, p. 225, Abb. 5.
- 88 Pogrebova 2003, Figs. 2 and 3.
- 89 For discussion of the date of the Gordion altar see Drews 2004, p. 68.
- 90 Drews 2004, pp. 65–67, with Figs. 4.1 and 4.2.
- 91 For details see Drews 2004, pp. 83–98, with Figs. 4.6–4.11.
- 92 Hüttel 1981, p. 191.
- 93 See Littauer and Crouwel 2001, Fig. 1, for an illustration of the bronze bit found at Tel Haror. This bit, excavated by Eliezer Oren and published in 1997, came from an equid burial dating to the MB IIB period, and so is the earliest known metal bit. It was found in place on the skull of a donkey (the skeleton of a second donkey was found nearby, suggesting the burial of a paired draft team).

- 94 In Europe and the steppe the only specimens of this type are Nos. 245–249 in Hüttel 1981. At p. 161 Hüttel says that for the earliest of these, No. 245 (from western Switzerland), on the basis of stylistic similarities “erscheint eine Datierung in die Späturnenfelderzeit am wahrscheinlichsten.”
- 95 Hüttel 1981, p. 124: “Bronzeknebel und bronzene Mundstücke sind im ‘barbarischen’ Europa erstmals in jungbronzezeitlichem Fundzusammenhang bezeugt.” Nor had a metal bit from before 1000 BC been found on the steppe in the 25 years after Hüttel compiled his catalog. See Epimachov and Korjakova 2004, p. 224: “Metallknebel, ebenso wie Metallmundstücke, in den eurasischen Steppen für die Bronzezeit bislang nicht belegt sind.”
- 96 Dietz 1998.
- 97 Drews 2004, p. 83 and p. 177, nn. 69 and 70.
- 98 On the debate about the time when the steppe population became fully nomadic see Drews 2004, pp. 73–74. Bokovenko 2000, p. 304, observed that full nomadism began early in the 1st millennium BC, thanks mostly to “significant progress in horsebreeding and the development of a more reliable type of bronze bridle.”
- 99 Hacker 2012, pp. 184–185.

3 Warfare in Western Eurasia in the third and early second millennium BC

In the September 9, 2009 issue of *The New Republic* Edward Luttwak reviewed two books on Attila and the nomads of central Asia. In the course of his review Luttwak noted that Attila's meteoric success has attracted relatively little scholarly attention, and he observed somewhat sourly that for most academicians military history of any kind is not of much interest:

There is almost no place, and almost no prestige, for anyone who wants to research and teach how and why battles and wars were won or lost—that is, military history strictly defined—as opposed to social history, economic history, and some forms of political history, including newly rehabilitated biographical approaches but excluding “kings and battles.” Even research on “presidents and wars” is unwelcome unless there are cognitive or psychological pathologies to be studied. And there is the added impediment that military historiography is an arcane field, requiring serious archival research, often in languages other than English. While scholarly readers have an insatiable demand for military historiography, and students are very keenly interested in battles and wars, the faculties at our universities prefer to scant both. Appoint a military historian? The eminent Chicago Byzantinist Walter Emil Kaegi has explained why it almost never happens: tactics cannot matter, weapon techniques cannot matter, operational methods cannot matter, theater strategies cannot matter, because wars do not matter—as a subject of their own, rather than as epiphenomenal expressions of other causes and realities. Given the academic consensus that wars are almost entirely decided by social, economic, and political factors, there is simply no room for military history as such.¹

It is not surprising that academics today are less interested in military history than were academics 100 years ago. One of the important trends in historiography since the 1950s has been the increasing focus on the *longue durée* and a corresponding neglect of *histoire événementielle*. The crucial factors in human history, as seen by Fernand Braudel and the Annales School, are the environmental or socio-economic conditions that operate over centuries or even millennia. These are the subjects that serious historians are encouraged to study, leaving narrative history to popular writers, authors of text-books, and story-tellers.

War itself has made military history more of a pariah than it was 100 years ago. Since the advent of chemical and nuclear weapons we have come to recognize that unless war itself becomes obsolete we will destroy ourselves and render the earth unlivable. The writing of military history easily veers into the justification or even the glorification of war, toward which few historians wish to contribute. Even while we see the suicidal character of what war has become, however, and begin to de-glorify what it once was, historians must continue to learn what they can about the evolution of warfare. Wars have shaped much of what we are and what we are not, as historians beginning with Herodotos have been well aware.

Warfare in pre-classical antiquity is especially in need of critical study. Ancient warfare is treated regularly by commercial presses and now by websites on the Internet, because the public appetite for it is almost inexhaustible. Such presentations may be correct enough on warfare in Greek and Roman antiquity, but on earlier periods they often leave much to be desired. In the nineteenth and early twentieth century, military historians—Clausewitz and Delbrück more broadly, Kromeyer and Veith in detail—described what warfare was like in classical Greece and Rome. From the war monographs of Thucydides, Xenophon, Polybius, Caesar and Sallust they drew pragmatic lessons about the winning of battles and wars. Warfare in the Bronze Age and the Early Iron Age, however, was so obscure—estimates depended mostly on the *Iliad* and the Bible—that the military historians had little use for it.

Some opinions on primitive warfare

Still more obscure is the subject of warfare before civilization. If we are guided by what was observed about primitive societies in the nineteenth or early twentieth century, we may suppose that from time to time pitched battles were staged in the Paleolithic period, but these would have been what anthropologists have called “ritual battles.” Men from competing communities met on a “battle-field” to exchange insults and arrows, and after a few casualties brought the event to a close. Another kind of battle that must have occurred in Paleolithic times was far more serious and costly. When a massacre was planned, but the target community learned of the plan early enough to prepare for it, a real battle may have taken place, as the aggressors were themselves surprised. The battle would have continued until either the aggressors were repelled or the defenders were killed.

How often such encounters occurred is much debated by anthropologists. The generalization that simple or pre-civilized societies were peaceful, a generalization that Margaret Mead based on field work in Samoa, has for some time been rejected by many anthropologists and prehistorians. One of the first to object, in the 1940s, was Harry Turney-High, an anthropologist whose specialization was society in pre-Columbian America.² In 1996 the revisionist view was fully articulated by Lawrence Keeley.³ Wielding statistics from osteological evidence, Keeley concluded that people in primitive societies were much more likely to die a violent death, by human hand, than people in civilized societies have been.

Violent death, however, does not necessarily imply war or even a battle: individual homicides and family feuds may have accounted for much of the skeletal trauma. Even the massacre of an entire community may not easily fit most definitions of “war,” although the word has an unusually elastic meaning (in his *History of Warfare* John Keegan devoted ten pages to the question, “What is war?”). Succinctly, the 1969 edition of *American Heritage Dictionary* defined war as “a state of open, armed, often prolonged conflict carried on between nations, states, or parties.” A recent study argues in considerable detail that in the Near East the evidence for war in the Upper Paleolithic, Mesolithic and Early Neolithic period is very slim.⁴ Others suggest that the various forms of mass violence were less frequent than Keeley thought they were. John Carman charged that Keeley’s conclusions rest on only eleven instances of mass violence in 30,000 years of European prehistory, and that “on the basis of this short list, Keeley attempts to persuade us that war was widespread in Europe before the Bronze Age and that it was as violent and unpleasant as any modern war.”⁵

Some opinions about warfare in the Bronze Age

The discussion about pre-state violence, and the prevalence of it, will continue to be intense, especially because the topic is an aspect of a larger debate about human nature and human potential. A topic much less controversial is the incidence of warfare in the period of the early civilizations in the ancient Near East. Assyriologists, Egyptologists, archaeologists and military historians are all agreed that with the appearance of the state, whether territorial kingdoms such as Egypt or city-states such as those of southern Mesopotamia, wars were an important part of human history.

How these wars were fought, however, is far from clear, despite the confidence with which they have often been described. Warfare in the ancient Near East was hardly a scholarly subject at all until 1963, when Yigael Yadin’s semi-popular *The Art of Warfare in Biblical Lands in the Light of Archaeological Study* was published. As its title suggested, Yadin’s two-volume set was a merger of archaeology and the Bible, its chapters marked off by biblical signposts (“Before Abraham,” “The Patriarchs,” “Moses and the Exodus,” and so forth). Yadin presented a good picture of Iron Age battles in the Near East and also added his authority to several points that others had long recognized about the Late Bronze Age.

Yadin’s pioneering survey might have launched a critical history of Bronze Age warfare. Instead, because of the author’s distinction both as an archaeologist and as a general officer in the Israeli army, his *Art of Warfare* seemed definitive. For a long time deskbound scholars, including the present writer, saw no reason to question Yadin’s conclusions, several of which—especially on the third and second millennium BC—are now clearly wrong. Much of Yadin’s reconstruction of Early Bronze Age warfare was based on the visual evidence that was available in 1963, and not well understood. Especially influential were the Ur Standard and

the Stela of the Vultures. When he looked at the representations on these artifacts Yadin, like other scholars at the time, saw well-ordered phalanxes of spear-bearing infantrymen clashing with each other, while four-wheeled “chariots” sped across the Sumerian battlefield. Models of two-wheeled carts, although the wheels were solid and the draft equids were controlled by nose-rings, convinced Yadin that Mesopotamian chariot units were widely used in battle, and that “[w]ith all its shortcomings, the Mesopotamian chariot was assuredly a formidable and decisive instrument of warfare in this region. And it was used continuously in its basic original form throughout the whole of the third millennium.”⁶ Placing both phalanxes and chariots in the Early Dynastic period, Yadin saw “normal” warfare beginning almost as early as civilization itself:

During the second half of the fourth millennium, and more markedly during the third, the foundations were laid for the principles of warfare and the basic types of weapons and fortifications which prevailed during the succeeding 3,000 years—indeed, right up to the discovery of gunpowder in the 15th century A.D.⁷

This picture of highly developed warfare (with the onagers and “chariots” front and center) in the Near East during the third millennium BC still appears regularly in histories of ancient warfare.⁸ A stark alternative, however, is available. To the traditional view a trenchant paragraph in Doyne Dawson’s *The First Armies* offers a bold challenge that is incapable of proof but likely to be much closer to the truth:

[T]he wars of complex agrarian societies seem always to turn on the clash of masses of foot soldiers in more or less disciplined formations. It is hence commonly and not unreasonably assumed that state-level warfare of the Clausewitzian type must have arisen simultaneously with the rise of the state in about 3000 BC, and that infantry warfare arose at the same time. But it will be argued herein that in fact there was a startling time gap, two thousand years long, between the rise of the state and the rise of state-level warfare. Three stages can be discerned in that long transition. Clausewitzian warfare became technically possible with the development of city states in Mesopotamia by 3000 BC, but the evidence suggests that did not happen. Instead, the first states poured their resources into fortification, a purely defensive strategy which prohibited offensive warfare; insofar as offensive warfare existed, it was probably little different from that of the Stone Age, and no more effective as an instrument for achieving political objectives. In the second stage, after 1700 BC, offensive wars between well-organized states became common, but this was a type of warfare unlike any before or since, relying upon elite groups of horsed chariotry, with such infantry as there was in a passive and subsidiary role. Finally, after 1000 BC, the first true infantry formations appeared, as did the first true cavalry, and the art of war as we know it was born.⁹

In the same year (1963) that Yadin's *Art of Warfare* appeared, a helpful discovery about Late Bronze Age warfare was published by Egyptologist Alan Schulman, in his study of chariotry in the New Kingdom.¹⁰ The "runner" (*phrr*) often shown in reliefs or mentioned in Egyptian inscriptions, Schulman concluded, was a man on foot who ran along with the chariots to engage the enemy (crewmen of disabled chariots, as well as enemy "runners") with hand-to-hand weapons. Schulman's publication in a low-circulation periodical was swamped in the wake of Yadin's *Art of Warfare* and no more was done with the "runners" until 1984, when Nigel Stillman and Nigel Tallis included them in a little book that was barely noticed by Assyriologists, Egyptologists, or Near Eastern archaeologists.¹¹ In 1988 I stressed the primacy of chariotry in the Late Bronze Age but made no mention of "runners," because I had not noticed them either. And on warfare before the advent of chariotry I was as far off as everyone else.¹²

Five years later, I was still wrong about warfare in and before the Age of Hammurabi, but did shed some light on warfare in the Late Bronze Age. Having read what Schulman, Stillman and Tallis had written, and having looked through our documentary evidence, I argued that in Late Bronze Age battles "runners" were the only offensive infantry, chariots doing almost all of the offensive work, and that at the end of the Bronze Age large bands of renegade "runners"—armed with javelins as long-range weapons, and thrusting swords (not slashing swords) for hand-to-hand combat—gathered to defeat the chariot armies and to sack the cities that had depended on them.¹³ The other half of the argument was that by the reign of Ramesses III (and during the LH IIIC period in Greece) kingdoms began using close-order formations of offensive infantry on the battlefield, each man equipped with spear and shield, in order to corral and kill the swarming "runners."

This view of Late Bronze Age warfare, needless to say, is not widely shared. Many and probably most scholars still believe that through the entire Bronze Age formations of infantry clashed on the battlefield, and that when chariots made their appearance in the Late Bronze Age they were only ancillary to the infantries.¹⁴ Nor is there even a consensus about the role of chariots in the Late Bronze Age. On Homer's authority many specialists on the LH Aegean believe that the Mycenaean palaces kept several hundred chariots to serve as battle-taxis for several hundred infantrymen, each wearing something like the Dendra corselet of plate bronze (the weight of the corselet was at least 15 kg). In objecting to my reconstruction of Late Bronze Age warfare Mary Littauer and Joost Crouwel argued that even in the Near East chariots were only of limited use, and in Greece merely "functioned as a means of transport for warriors who fought not from the vehicle but on the ground with close-range weapons."¹⁵

As for warfare on the Eurasian steppe and in temperate Europe, many Indo-Europeanists still accept Marija Gimbutas' thesis that in the fifth, fourth and early third millennia BC steppe warriors on horseback invaded Europe, took over large parts of it, and introduced militarism into what had until then been a peaceful society. In one of her last publications Gimbutas reiterated her belief that "the Kurgan peoples," having learned to ride the horse ca. 4500 BC, exploited its military

value in conquering Old Europe: “A well-equipped warrior on the ground is formidable enough, but on horseback he undoubtedly became a terrifying opponent.”¹⁶ The corollary of Gimbutas’ thesis, although seldom stated, is that through the rest of the Neolithic and through all of the Bronze Age men in temperate Europe fought from horseback.

These are profound misconceptions, I am quite certain, and much more about early warfare remains to be explored. The goal of this chapter is to separate what is assumed from what is known about warfare in western Eurasia before the introduction of chariots. At the outset it must be admitted that for most of western Eurasia few conclusions can be drawn, and even those few are tentative. Because for prehistoric Europe and the Eurasian steppe the subject of warfare is almost totally obscure, we must take a long and close look at the Near East. There our documentation is full enough—especially for Mesopotamia—to make at least a few pertinent observations. Recent surveys by Doyne Dawson and William Hamblin have helped to bring together much that is known about warfare in the ancient Near East. Aaron Burke’s study of early siege warfare is illuminating, and also valuable are a variety of other specialized studies, including the essays edited by Philippe Abrahams and Laura Battini in *Les armées du Proche-Orient ancien*.¹⁷ Those of us who are not Sumerologists or Assyriologists are fortunate that thousands of early cuneiform texts have now been translated into one of the modern languages: the ongoing translations in the *Archives Royales de Mari*, and the translations by Jerrold Cooper, Ignace Gelb, Burkhard Kienast, and Wolfgang Heimpel.

Warfare in Mesopotamia in the third millennium BC

Although warfare was common, and almost constant, in the ancient Near East during the third and early second millennium BC, the kind of warfare with which Near Easterners were familiar was not what a modern reader would expect. This has seldom been recognized by military historians—Dawson’s book is an exception—and it is still widely assumed that all through the third and early second millennia a Near Eastern king took a sizeable army out on campaign and sent it into battle against another king’s army. That assumption is without support. What evidence we have suggests that warfare normally meant the siege of a city, and not a battle in the open country.

Ideas about warfare in Sumer and Akkad still come mostly from the Stela of the Vultures, erected by Eanatum of Lagash after his victory (ca. 2450 BC) over the city of Umma, and from the Ur Standard. Although the relief for which the Stela of the Vultures is named shows vultures feasting on the heads and hands of the Ummites, another relief on the stela shows Eanatum’s helmeted men advancing in a close-order formation with spears and shields, and treading over the naked bodies of slain Ummites. Most often, the latter relief has been understood—despite the fact that the Ummite casualties are naked—as evidence that in Sumerian warfare one phalanx battled another in open country. The inscription on the stela suggests that the battle was not entirely—and probably not at all—the clash of close-order

infantry formations. The only sentences in this lengthy inscription that refer to the battle itself have been variously translated, but Sumerologists agree that the text tells of Eanatum being hit by an enemy arrow:

He fought with him. A person shot an arrow at Eanatum. He was shot through by the arrow and had difficulty moving. He cried out in the face of it. The person . . . [(12 cases broken or frag.)]. Eanatum provoked a windstorm in Umma, unleashed a deluge there.¹⁸

Because Eanatum was wounded in what must have been an exchange of missiles, it may be that the “phalanx” went into action only at the end, to force its way into Umma’s main gate after Eanatum’s archers and slingers had slain many of their opponents.

That possibility is strengthened by the best evidence we have for Mesopotamian combat in the third millennium BC. This is a relief on a small stone slab discovered in 1971 by André Parrot in his excavations at Mari. The slab came from the pre-Sargonic palace at Mari, and therefore dates toward the end of the Early Dynastic period (ca. 2400 BC).¹⁹ Although Parrot misinterpreted the scene, Yadin immediately recognized it as the earliest representation of a siege in Mesopotamian iconography (see Figure 3.1).²⁰

The portable shed (or canopy-shield), which protects both the holder and the archer from arrows or sling-stones coming from above, is well known from Neo-Assyrian reliefs depicting a siege.²¹ On the slab shown here we see one of the besieging archers shooting an arrow almost vertically, and a naked defender falling through the air. The archer is armed with a composite bow with reflexed tips. In light of this slab from Early Dynastic Mari, we may be able to make better sense of the relief on the Stela of the Vultures, which dates from the same period. The naked Ummites whom the stela shows being trodden underfoot by the phalanx can perhaps be understood as defenders who had fallen from atop Umma’s city wall, where they had been sending arrows or sling-stones down on the besieging force from Lagash.

For the last 90 years the “chariots” of the Ur Standard have been seen as central to Mesopotamian warfare in the third millennium BC. Samuel Noah Kramer supposed that “the kings established a regular army, with the chariot—the ancient ‘tank’—as the main offensive weapon,” and that assessment now appears regularly in military histories.²² It is, however, surely wrong. Sumerian and Akkadian texts relating to warfare do not mention the wagons.²³ The four equids (onagers? donkey/onager hybrids?) that pulled each wagon were controlled—hardly the right word—by nose-rings. Littauer and Crouwel observed that such a mechanism could only stop the animal from moving forward, and that “directional control, if attempted, must have been by voice, goad, or whip, or combinations thereof—as oxen may still be directed.”²⁴ The lack of directional control over his equids would not have distressed the Sumerian driver, because his wagon was not built to change directions. With a front axle that did not pivot, the wagon “could only be turned in a wide arc or by manual lifting or levering of its rear wheels.”²⁵



Figure 3.1 Siege scene incised on a stone slab, from pre-Sargonic palace at Mari. From Figure 1 in Yadin 1972 (after Parrot 1971, plate XIV, no. 4). Courtesy *Israel Exploration Journal*

Enemies on foot who were pursued by such a vehicle would have needed only—if they had not already stopped it by spearing one of the onagers—to turn aside in order to evade it.

On the Ur Standard the wagons drawn by four equids abreast are shown rolling over dead or injured enemies, all of whom are naked, and Dawson is probably correct in suggesting that the vehicles were built precisely for that purpose: to trample and crush enemy casualties.²⁶ The vehicles should probably be called triumph- or trampling-wagons rather than battle-wagons. After the wall had been cleared of defenders the wagons may have been brought up to crush those slingers and archers who had fallen to the ground from atop the wall. The first attested use of equids in battle between Near Eastern kings, as we shall see in Chapter 4, occurred ca. 1750 BC in Anatolia. An inscription of Anitta of Kanesh indicates that he employed (or possibly met) forty teams of chariot horses in his siege of Šalatiwara. That was a harbinger of a storm that would soon sweep over all of the Near East.

Warfare in the Akkadian period, as in Early Dynastic Sumer, evidently centered on the besieging of cities. Although more than 8000 cuneiform tablets in Old Akkadian have been found, they tell us less about Akkadian warfare than one would suppose.²⁷ Most of the tablets dealing with military matters are administrative texts that tell us something about conscription, recruitment, and remuneration, but not about the way that battles were fought.²⁸ Other tablets, dating especially from the Old Babylonian period, are copies of inscriptions that had been set up by Sargon and his four successors on the throne of Akkad: Rimush, Manishtushu, Naram-Sin, and Shar-kali-sharri. These inscription-copies tell us more, but—like all royal inscriptions—they cannot be taken at face value.

How many people in Mesopotamia and neighboring lands were killed by Sargon's armies is not known, but the boasts of his successors as kings of Akkad are detailed. Although we have no idea how far the boasts are from the truth, they at least tell us how these kings wished to be seen by their subjects and their gods. Rimush, Sargon's son, claimed to have killed Akkad's enemies by the tens of thousands: an inscription reported that in a single encounter Rimush's troops killed 16,212 "young men" from (or in) the Elamite region of Barahšum,²⁹ and the figures for a single campaign add up to more than 70,000 enemy casualties.³⁰ Such carnage is difficult to believe, and difficult to square with what little is known about Akkadian armies. An inscription of Sargon declared that "every day 5400 men ate their bread in front of him," and that claim has been taken to indicate the size of Sargon's standing army.³¹ A distinguished Assyriologist has recently concluded that Sargon's army of 5400 men was "a military force that no other ruler of the time could match or withstand."³² If that is correct, it is difficult to imagine that Sargon's son could have faced an army of 16,212 men, and killed all of them. In the copies of Rimush's inscriptions are we dealing with outright lies, with scribal inflation, or with a slaughter of the general population?

It has been widely supposed that the Akkadian kings' many victories (in one inscription Sargon claimed thirty-four of them) were won on the battlefield. Akkadian kings certainly had warriors armed with bows, axes, maces and spears and it

is very likely that the warriors were at least occasionally sent into battle in the open country.³³ The famous Victory Stela of Naram-Sin was erected for the several gods who gave him victory over the Lullubi of the northern Zagros. That they were able to defeat the Lullubi in their own mountainous and wooded terrain suggests that Naram-Sin led men who excelled in some kind of *mêlée* warfare. The same may have been true of some of the warriors employed by Sargon and Rimush.

Although the Akkadian kings must have led their armies into open battles against mountain dwellers and nomadic tribesmen, Aaron Burke has argued that the many victories that the Akkadian kings claimed over Mesopotamian and Syrian cities were won not on battlefields but in sieges:

In the many inscriptions that record these engagements it is said, for example, that a particular king was victorious over a given town in battle, conquered that town, and destroyed its walls. One notable example refers to Sargon's defeat of Uruk:

[Sargon] . . . conquered the city of Uruk and destroyed its walls. He was [victorious] over Uruk in battle [conquered the city], . . . (*RIME* 21.1.1. Ins. 12–22)

Identical phrases were employed in the same text to describe Sargon's battles against other cities such as Ur, Eninmar, and Umma. Although it is possible that what is meant in such texts was that opposing armies first fought in open battle outside the town and the victorious invaders ruthlessly destroyed the town, the juxtaposition of references to "battle" and "that he conquered the city" more probably means that the battles referred to were sieges. This is, in effect, a poetic parallelism that depicts the nature of the battle. This interpretation is corroborated by another inscription of Sargon in which a reference to his victory in thirty-four battles is followed by the phrase, "he destroyed their (city) walls" (*RIME* 2.1.1.11, Ins. 5–6).³⁴

Although Burke is very likely correct that in the days of Sargon and his successors at Akkad warfare meant mostly the besieging of a city and the destruction of its walls, some fighting may have taken place before a siege began. Taking our cue from what is known about warfare in the reign of Hammurabi we may imagine that when Sargon's troops (many of whom would have been laborers, needed for construction of siege-works) approached a city the king of the threatened city may have sent out at least a few of his archers and slingers in an attempt to ambush the Akkadians, and so to delay or discourage their progress. In this ambush the Akkadian archers would have prevailed and Sargon's massive column would have continued on toward the city. The battle would in any case not have been—and would not have been intended to be—a decisive encounter: it was a delaying or disrupting tactic, and what was decisive was the siege itself, commencing with the battle from below and from atop the city's wall.

Finally, during the Third Dynasty of Ur (ca. 2112–2004 BC), and with it the "Sumerian Renaissance," warfare seems again to have consisted of sieges rather

than of battles in the open. Some 80,000 Neo-Sumerian tablets have been recovered and well over half of these have been published. Although many of the tablets refer to warfare, they provide us with little usable information about it. For the little that we have we are indebted to Bertrand Lafont, who sifted through a great many tablets in search of it.³⁵ We know that the typical campaign included the siege of one or more cities, but we know almost nothing about the force assembled for the campaign. Lafont recognized that a campaign was a major undertaking, requiring extensive planning and logistical support:

It is naturally frustrating, therefore, to find that the massive documentation for this period contains virtually no evidence about either these armies or the kingdom's military organization in general. Even with such a quantity of texts, we cannot fathom how soldiers were recruited, supplied, maintained, equipped, armed, organized, disciplined and launched into battle.³⁶

A tablet from Girsu, for example, told Lafont that in the third year of Ibbi-Sin provisions were sent for the feeding of an "army" (in Sumerian, an *erin₂*, which Lafont translates as "troop"). The provisions were a staggering 159,600 liters of barley and 47,400 liters of flour. The "army" that Ibbi-Sin had dispatched was obviously huge, the provisions being enough to feed tens of thousands of men for a long time, but nothing more is known about the "army" or its accomplishments.³⁷

How an "army" numbering tens of thousands could have been raised is clear enough. The tablets show that the kings of Ur, as representatives of the gods of Ur, could call upon all of their adult male subjects to serve in the "army." The large troop that went out on a campaign, consequently, was hardly an army at all, and included a large number of men who did not want to be there. Lafont describes how thorough was conscription during the Third Dynasty of Ur, and how it affected all able-bodied men:

Throughout the year every man (*guruš*) was thus obliged to devote a fixed time in service as a "member of the troop" (*erin₂*, Akk. *sabum*). He could then, depending on situation and need, be assigned either to work on civil projects such as construction, drainage, agriculture, etc., or to military service.³⁸

The "troop" (*erin₂*) was itself divided into two categories: one category included all those men in the "troop" who were currently on active duty, and the other category included all who were currently inactive. Apparently a man's category was assigned month-by-month, and a complex bureaucracy was required to manage all of this. Adding to the complexity was the fact that some men resisted coming forward and had to be "seized by arms." How many days of the year the typical *guruš* spent in *corvée* service is uncertain, but on the basis of the Girsu and Umma archives Lafont concludes that the men in the *erin₂* "would have devoted at least half of their time to state service."

The “armies” sent out from Ur were surely employed in siege warfare. An important indicator about warfare during the Third Dynasty of Ur was noted by Burke: the names used to identify the regnal years of the five kings of the dynasty never refer to a pitched battle. Dozens of the year-names refer to military actions, but the actions are invariably sieges.³⁹ Although battles against “barbarians” may have been fought in the open country during the Third Dynasty of Ur, we must concede that none of these encounters was celebrated sufficiently—or was deemed important enough—to enter into the collective memory of the king’s subjects.

Near Eastern warfare during the reign of Hammurabi (1792–1750 BC)

A period for which we are relatively well informed on the subject of warfare is the reign of Hammurabi (1792–1750 BC on the middle Mesopotamian chronology), thanks especially to cuneiform texts from the palace at Mari. In the thirty-fourth year of his reign Hammurabi destroyed the palace (along with the walls of Mari), thereby burying more than 20,000 clay tablets. Almost half of these tablets have now been published, and from volumes 26 and 27 of the *Archives Royales de Mari* Wolfgang Heimpel has provided a new translation of close to 1000 letters sent to Zimri-Lim, king of Mari, most of the letters having been dictated to scribes by Zimri-Lim’s commanders in the field.⁴⁰

The letters that Zimri-Lim received say little about combat of any kind. The commanders are concerned about divining the will of the gods, about receiving food, boots and other provisions from the palace, about the constantly shifting alliances of cities and their allegiance to the Great Kings, and about the comings and goings of enemy troops. The commanders do not, however, seem concerned about either attacking enemy troops or being attacked by them, and the modern reader must wonder what exactly the “troops” were. The letters report no combat other than incidental skirmishing, usually resulting in a very few casualties. We must imagine thousands (and sometimes tens of thousands) of men in rival troops annually on the move in Hammurabi’s Mesopotamia, but we do not know that these rival troops confronted each other on battlefields or even intended to do so.

Assyriologists working with the Mari tablets have not found descriptions of, or references to, pitched battles. In the 1960s Albert Glock and Jack Sasson, poring over the early volumes of the *Archives Royales de Mari* in order to find what they had to say about warfare, came across raids, ambushes and sieges but nothing about battles in the country.⁴¹ Sasson’s short “Tactics” section dealt only with ambushes.⁴² Introducing his chapter titled, “The Battle,” Glock explained what “battle” meant in Hammurabi’s Mesopotamia:

We hear nothing of battle lines drawn in an open field. The opposing army gathered itself for defense inside the fortifications of a city. The attack was, therefore, against a formidable barrier, the city walls and related defenses, as well as an army of defenders.⁴³

As more texts from Mari have been published it has become quite clear that in the Age of Hammurabi there were no pitched battles between kingdoms. Stephanie Dalley, after quoting Ishme-Dagan's boasts about his successful sieges, concluded that "[t]he siege was perhaps the main means of victory for one ruler over another. We have no detailed accounts of pitched battles, but numerous references to sieges or to negotiated surrender."⁴⁴ More broadly, Aaron Burke concludes that "among textual sources from the Levant, Egypt, and Mesopotamia there are no clear references to large-scale open battles prior to the Battle of Megiddo in the Late Bronze Age."⁴⁵ Iconographic evidence too, Burke observed, portrays sieges but not battles on a battlefield: in Egypt the pharaohs of the New Kingdom were regularly portrayed as heroes on the battlefield, but Middle Kingdom pharaohs had themselves portrayed as capturing one or another fortified place.⁴⁶

What Mesopotamian warfare actually was in the Age of Hammurabi can best be understood through a close look at what has been called "the Battle of Hiritum," which is seen as one of the more decisive encounters of the period because it ended an Elamite "invasion" of central Mesopotamia.⁴⁷ Our information comes from a series of letters sent to King Zimri-Lim of Mari by one of his commanders, Zimri-Addu. At this time (probably 1764 BC) Zimri-Lim and Hammurabi were allies, and forces from Babylon and Mari were therefore collaborating against the designs of the Elamite king and his vassal in the city of Eshnuna. Thousands of Elamite and Eshnunakean "troops" were laying siege to the city of Hiritum, on the Irina river and not far from its entry into the Tigris, and the forces led by Zimri-Addu and his Babylonian counterpart had evidently been ordered to do what they could to prevent Hiritum from falling to the enemy. To that end, it appears, the Babylonians and Mariotes set up a camp near Hiritum and Zimri-Addu's men succeeded in setting fire to one of the Elamites' siege towers. This feat Zimri-Addu reported at least twice to his king, as Heimpel's translation of letter 27 141 shows:

To my lord speak! Your servant Zimri-Addu (says): The troops of my lord are well. Some time ago I wrote my lord that [we set] fire to the tower (standing) [on] the lower fringe and (that) the enemy [] for obtaining a(nother) tower. Now, that method. . . one tower. [One] remained standing.⁴⁸

In the same letter Zimri-Addu goes on to say, with some satisfaction, that the Babylonian troops made an incursion into the land of Eshnuna, burned grain fields, and carried off sheep, cattle and prisoners. At another time, however, 2000 Mariotes and 3000 Babylonians stationed at Ša-bašim went out on campaign under the command of Ibal-Pi-El, but the enemy got word about them "and the troops returned empty-handed." The servants of Hammurabi were angry and said, "How can 5000 troops go out campaigning and return to camp empty-handed? Let them stay one day or two at Ša-bašim and then let them return to campaigning!" Zimri-Addu reasoned that Ibal-Pi-El must have gone out on campaign without having obtained favorable auspices from the gods and scolded him for his negligence: "I said to you, '(Only) go out from Ša-bašim upon sound

extispicies!’” Zimri-Addu then sent Ibal-Pi-El more lambs to be sacrificed for more extispicies. “Have extispicies done and do what is necessary [according to] sound, faultless, extispicies, and (what is necessary) to safeguard the troops.’ This I wrote to him.”

It is fairly obvious from Zimri-Addu’s letter that the 5000 troops under Ibal-Pi-El did not go out into the country in order to bring their Elamite and Eshnunakean enemies to battle. They went out to plunder, and were prevented from doing so because an Elamite force appeared on the scene. In attempting to carry out their mission they had apparently been careful to stay out of harm’s way. How many of the 5000 carried arms we do not know (my guess is that most did not).

In his next letter Zimri-Addu reported to his king that in a “battle” Mariote troops who were stationed opposite the enemy’s tower and siege ramp succeeded, with help from their Babylonian allies, in pushing the Elamites off the siege ramp:

The day when battle was done, Dagan-Mustesir distinguished himself very [much]. [] fire [] and was kept burning in front of the tower. And of the troops of my lord, many troops distinguished themselves.⁴⁹

Evidently some combat had occurred, probably at long range, but it must have made no difference. The next day, the enemy was back on the ramp but had difficulty with it and with the fire burning near the remaining siege tower. When the Elamites realized that their ramp would never reach the crown of the wall because the earthen pack was sinking as the lower end was washed into the Irnina river, they abandoned their siege. So ended “the Battle of Hiritum.”

Other letters from Zimri-Addu followed from the camp at Hiritum, and in one of them he reported that according to Hammurabi’s men “the Vizier of Elam dispatched 20 thousand Eshnunakean troops and 10 thousand Elamites—30 thousand troops—to the land of Subartum.”⁵⁰ That news—which to us sounds ominous—does not seem to have been of great concern to either the sender or the recipient of the letter, because Zimri-Addu’s troops, after some travelling around, returned to Mari. We note that the troops sent from Mari and Babylon to disrupt the Elamite siege of Hiritum did not confront the Elamite troops on a battlefield. More importantly, from his letters it appears that Zimri-Addu and his Babylonian colleague never had any intention to bring their Elamite opponents to battle.

An especially consequential “battle” fought during Hammurabi’s reign took place in his thirty-third year, when he took troops north from Babylon in order to make the city of Mari his vassal. The date-formulae for his reign identify the thirty-third as the year in which Hammurabi “overthrew the armies of Mari and Malgium in battle. Mari and its villages and the many towns of Subartu submitted peacefully to (Hammurabi’s) authority.”⁵¹ Perhaps some Mari archers and slingers tried and failed to prevent the progress of Hammurabi’s troops, but whatever battle took place is likely to have ended in the “negotiated surrender” that Stephanie Dalley often found in the tablets. The date-formulae identify the thirty-fourth as the year in which Hammurabi destroyed Mari’s fortifications and its palace, an action that provided us with 20,000 clay tablets.

In the Age of Hammurabi battles in open country, if they occurred at all, would have occurred in asymmetrical warfare: such a battle may have been fought, that is, if the king of a city decided to attack people who did not live in a city. In Mesopotamia these would have been nomadic or semi-nomadic bedouin, Amorites who lived in tents, or Gutian villagers in the foothills of the Zagros. In Egypt the Kushites pressing northward into Upper Egypt or Libyans moving eastward into Lower Egypt were certainly targeted in campaigns.

The men whom a king sent to do battle were not heavily armed and armored members of a phalanx but skirmishers who wore no defensive armor and wielded a single weapon: a bow, a sling, a spear or an axe. Most fighting men seem to have come from the tribes of nomadic pastoralists. Men who lived within the walls of a city were not often required to handle a weapon, while those who lived outside were likely to have a weapon readily accessible and to know how to use it in defense of a herd or a flock. We may recall how (at I Sam 17:34–36) David brags that as a lad he watched his father's sheep and often slew or drove off lions and bears. Nomadic pastoralists were especially ready to defend themselves and their animals against either beasts or other nomads. Because they were not averse to violence the nomads were sometimes a threat to a king's land, and when they caused trouble the king was compelled to drive them back into the wilderness. For such a campaign the king impressed few of his own subjects into military service, because few of them would have made good soldiers. Instead, he turned to other nomadic communities and there found most of the archers, slingers and spearmen he needed. Perhaps the king's men and mercenaries would have looked something like the wooden figurines of Nubian archers and Egyptian spearmen—the latter carrying large leather shields—found in the Tomb of Prince Mesehti (Mesehti was governor of Asyut, a short sail downstream from Karnak, late in the Eleventh or early in the Twelfth Dynasty). Although they undoubtedly marched together, there is no likelihood at all that the king's warriors went into battle in disciplined formations. Neither they nor their opponents would have worn defensive armor, neither side could have had a chain of command, and in the encounter it would have been every man for himself. Prisoners were seldom taken: the victor would normally cut off the genitals of a wounded opponent or slit his throat and decapitate him. A reward was given for every head and every penis turned in as a trophy.

In Mesopotamia a nomadic tribe, such as the Banu-Yamina ("Sons of Yamin," or "Sons of the Right Side," or "Sons of the South," mentioned frequently in the Mari texts), typically consisted of several clans, each clan supposedly descended from its own eponymous ancestor. The clan, in turn, was scattered across many encampments. A single encampment included only a few dozen men, because the grass available within reach of an encampment was too sparse to feed a high concentration of the nomads' flocks and herds. When a king recruited several hundred nomad mercenaries, they would necessarily have come from many encampments. At seasonal festivals all the clans met in conclave at a traditional holy place, and there an invitation could be made for a host of volunteers. At one point Zimri-Lim of Mari recruited 5000 mercenaries from "the Hana," which

may have begun as the name of a tribe but became—in the Akkadian of the Mari scribes—a generic term for “nomads” or “bedouin.”⁵² Wolfgang Heimpel underscored the difference between the Hana and the settled Mesopotamians as soldiers:

The life of the Hana differed markedly from that of their agricultural and urban kin. They were experienced outdoor people and highly valued soldiers. They could deal with lions where urbanites failed (26 106) and found the tastiest locusts for the royal table in faraway locations (27 64). Their military prowess is documented frequently and clearly.⁵³

Assyriologist Nele Ziegler has recently looked closely at texts relating to the recruitment policies of Shamshi-Adad I. Ca. 1800 BC Shamshi-Adad ruled from the city of Shubat-Enlil (Tell Leilan) and then took over both Mari and Assur. Included in Shamshi-Adad’s instructions to his younger son, Yasmah-Adad, whom he installed as ruler of Mari, was an order to recruit 400 nomads to guard Shamshi-Adad’s gate. Two hundred of these nomadic recruits were to be sons of fathers who could support them, and 200 were to be poor young men, who would be supported entirely by the palace. Ziegler is surely correct in her conclusion that Shamshi-Adad insisted on having a substantial number of poor men in his body-guard because they would be especially devoted and loyal to the king who provided their livelihood.⁵⁴

Shamshi-Adad and his fellow-kings also, of course, continued the time-honored practice of conscripting thousands of their own subjects. In a typical Old Babylonian kingdom were many men who owed the king *ilkum* (conscription) service. This status often required service as artisans, field workers or construction laborers, but might also require military service. In return for his *ilkum* service a man received a plot of land, which reverted to the crown when he died or left his service. The *ilkum* servants conscripted for military duty may have had some military training or experience, but other conscripts probably did not. The kingdom kept a census indicating how many men lived in each village, and in an emergency each village was assigned a quota of conscripts. That men so conscripted from the villages received any training in weaponry or tactical deployment is unlikely.⁵⁵

Weapons

By the eighteenth century BC most Great Kings in Mesopotamia and the Levant had acquired a few chariots, which they used for display, for recreation, and possibly for hunting excursions. In these lands, however, chariots were not yet used in warfare: none of the Mari letters mentions chariots in a military context. As Chapter 4 will show, there is some evidence that by ca. 1750 BC chariots were beginning to be used in sieges in central Anatolia. If so, the Anatolian kings not only would have acquired chariots and “tamed” horses but also would have recruited chariot drivers and archers who were experienced enough and skilled enough to warrant sending them and their precious transportation into danger.

There is no reason to think that kings in Mesopotamia and the rest of the Near East had yet made such an investment. In any case, the chariot revolution in warfare had not yet begun in Hammurabi's Mesopotamia.

In hand-to-hand combat during the Age of Hammurabi a warrior usually carried a leather shield and for offense depended on a spear.⁵⁶ The spears carried by the king's men were socketed. This was an improvement over Early Bronze Age spears, in which the metal spearhead was attached to the wooden shaft by a tang, the base of which was usually bent or hooked. Socketed spearheads were common in Twelfth Dynasty Egypt, and in the second millennium BC were standard throughout the Near East, including much of Anatolia.⁵⁷ Still important as a hand-to-hand weapon was the axe, which for much of the third millennium BC had been the primary weapon. The axe had of course a wooden handle, with a metal head fastened at the top, normally by a shaft-hole. Although it is conventionally called an axe, the term is somewhat misleading because today an axe is wielded with both hands and the ancient weapon was most often wielded with one hand. Perhaps "hatchet" or "tomahawk" would have been a better term, but "axe" is imbedded in the scholarly literature. Ca. 2000 BC Mesopotamians began experimenting with a sickle-axe, replacing the axe-head with a short curved blade. By the time of Hammurabi yet another cutting weapon, the sickle-sword, was in use in Mesopotamia and by the New Kingdom it made its way to Egypt, where it was known as a *khopesh*. The sickle-sword was some 50 or 60 cm long and was made entirely—haft and blade—of tin bronze. Toward the top of the bronze handle was a curved blade, whose convex edge was sharpened, and the weapon was used in much the same manner as the axe.⁵⁸ Swords were not yet part of a warrior's weaponry. The sword had been known in the Near East long before Hammurabi's time, but it was always a great rarity: precariously hilted, it was a ceremonial object or an impressive display piece for kings, rather than a weapon used in battle. In the Near East swords are not mentioned in texts or represented pictorially until after the Age of Hammurabi.

Sieges in the age of Hammurabi

Siege warfare in the Age of Hammurabi must be clearly differentiated from sieges in later periods of ancient history.⁵⁹ In classical antiquity the siege of a city—such as the Spartans' siege of Athens in 404 BC, or the Visigoths' siege of Rome in 410 CE—was often the culmination of a war, and the prerequisite for those conducting the siege was the decisive defeat of their enemy in battle if not the complete destruction of the enemy's military capacity. In Hammurabi's Mesopotamia, in contrast, when a king besieged a city it was not because he had already defeated the enemy. When Hammurabi and his contemporaries went to war, they fought no preliminary battle of any significance but proceeded directly to the siege itself. An ambush and *mêlée* might have occurred when the king of one city sent an "army" to besiege another city: the king of the city about to be besieged might have posted some of his fighting men in an ambush along the way, to harass the would-be besiegers and to delay or discourage their arrival.

Because a city's primary protection was not its army but its wall, immense effort was devoted to making the wall impregnable. In the Levant the early second millennium BC is styled the Middle Bronze Age, and the MB IIB and IIC periods were the zenith of urban fortifications. Cities of 20,000 or 30,000 inhabitants were not uncommon there, with walls 2 or 3 miles in circumference. These were sun-dried mudbrick walls, in many cases resting on a stone socle. For protection against erosion the walls were faced with a mud, gypsum or lime plaster. In most of the Near East a city wall was typically at least 10 m high, and some walls reached 20 m.⁶⁰ In the Levant the ruler of a Middle Bronze city ordinarily supplemented the fortification wall with a sloping rampart of earth. Once the rampart was in place, it was faced with a plaster or pebble glacis in order to protect it from erosion.⁶¹ While digging up the earth required for the rampart, laborers were at the same time digging a fosse, or a ditch, which also figured into the city's defense. Most of the fosses were evidently dry ditches, although a few may have been able to hold water and so to serve as a moat.⁶²

Erecting these fortifications was laborious. In his study of Levantine fortifications in the MB period, Burke calculated the person-days that would have been required to construct them. Using a formula, Burke concluded that at Shiloh—the smallest of the cities considered—9,650 person-days were required for amassing the earth rampart and another 18,835 person-days for the wall. For Hazor, the largest of the cities in the southern Levant, Burke's figures are 320,560 and 165,560 respectively (the earth rampart at Hazor was enormous).⁶³ Although impressive, these figures are considerably lower than those offered by earlier scholars, because Burke assumes—on the basis of several Akkadian texts—that a worker could bring 3 cubic meters of earth to the rampart each day. Israel Finkelstein, on a more pessimistic estimate of worker productivity, had calculated that 1,800,000 person-days were required to construct the earthen rampart at Hazor, and 1,000,000 at Tell Dan.⁶⁴ The fortification of Hammurabi's own city, Babylon, must have required thousands of men working for years.

Siege warfare, then, was the aggressor's attempt to go over, under, or through a city wall. The sector of the wall under attack would have been manned by hundreds of defenders: archers and slingers attempting from their high position to drive the aggressors back from the wall. For the siege to succeed a great deal of labor was again required. Often the besiegers began by building a temporary tower near the wall, so that from atop the siege tower their own archers and slingers could shoot arrows and hurl sling-stones down upon the defenders atop the city wall. Although the composite bow had evidently been known for 1000 years it was very expensive, and the bow used by ordinary archers in the Old Babylonian period was the "self" bow.⁶⁵ The effective range of a self bow—in terms of accuracy and penetrating power—was rarely more than 70 m, although its overall flight range may have been as great as 200 m.⁶⁶

A tower was merely a first step in the siege of a city, meant to provide some protection for crews of sappers, who would try to tunnel under a wall, or for the several dozen men operating a battering ram. Most often the tower helped to protect the huge labor force needed to construct a siege ramp. The aggressor's goal was

to bring the ramp up to the top of the city wall. On the size of the labor force required for the project Paul Kern cites a mathematical exercise inscribed on an Old Babylonian tablet. The ancient writer calculated “that if one man could haul two cubic meters of earth per day, it would take five days for 9,500 men, working twelve hours a day, to build a ramp to the top of a wall twenty-two meters high.”⁶⁷ The writer did not bother to estimate how many of these men would be injured or killed by enemy missiles. How to supply food and water for so vast an “army” must have been a science in itself. Bertrand Lafont called attention to the Neo-Sumerian texts detailing enormous amounts of provisions that the quartermasters deemed necessary: over 200,000 liters of barley and flour.⁶⁸

When the ramp neared the top of a wall, the defenders might prudently decide to capitulate, and to hand their city and its king over to the besiegers.⁶⁹ In such a case the siege ended, and the defenders and the city’s residents might be treated with restraint. If the besieged did not surrender, a battle was fought at the top of the ramp and the wall. Here may finally have occurred an attack by a phalanx of massed spearmen, each protected by a shield, such as in the scene that Eanatum of Lagash ordered his sculptors to portray on the Stela of the Vultures. Several hundred attacking spearmen must have outnumbered the defenders (the width of the wall at the top was rarely more than 4 m, much shallower than the siege ramp). The culminating battle was probably brief, an hour of combat terminating days, weeks, and occasionally even months of laborious siege operations. In some cases the besiegers—if they did not respect the city’s gods—followed their victory in battle by slaughtering most of the population, raping and enslaving the young women, and razing the city.

For most of the thousands of men whom a king needed in order to subdue another city the term “laborers” is more appropriate than “soldiers.” Although the Sumerogram ÉRIN.MEŠ is conventionally translated as “troops” or “army,” in the Age of Hammurabi most men in an ÉRIN.MEŠ were apparently not armed. Cuneiform scholars are more or less agreed that in Late Bronze Age and Neo-Assyrian texts ÉRIN.MEŠ can usually (although not always) be translated as “troops” or “army,” but for our period a more appropriate translation would be “labor force.”⁷⁰ The fighting men—many of whom were archers, slingers and spearmen recruited from nomadic tribes—were a small part of the total number. The labor force was normally conscripted in a *corvée*. As this huge troop—occasionally numbering in the tens of thousands⁷¹—moved toward the target city, it was accompanied by an armed escort. The men of the ÉRIN.MEŠ could find themselves caught in a skirmish if the enemy had planted an ambush along the way, but the entire troop was neither intended nor equipped for battle.

In summary, although battles in open country must have taken place in asymmetrical warfare—between a kingdom and stateless “barbarians”—we have no evidence that in the third and early second millennium BC the military forces of Near Eastern kingdoms, including Egypt, faced each other on battlefields. Absence of evidence, as archaeologists repeatedly caution us, is not evidence of absence, and we cannot prove that such battles did not happen. Given the sheer volume of textual evidence, however, we must ask that the burden of proof be

accepted by those who believe that from their beginning the cities and states of the Near East engaged each other in battlefield warfare.

Warfare on Crete and the Islands of the Aegean in the Middle Minoan II Period

From the well-documented world of Mesopotamia we turn to areas for which we have either no legible documents or no written records at all. What can be said about warfare on Crete and the Aegean islands in the Middle Minoan II period (ca. 1850–1700 BC) is dependent almost entirely on the artifacts and architecture that archaeologists have found. The findings suggest that early in the second millennium BC warfare of any kind was either uncommon or unknown in the Aegean. Impressive palaces stood on Crete, but neither they nor the island's cities were walled. The occupants of the palaces evidently had no reason to fear the siege warfare that occurred so frequently in Mesopotamia or on the periphery of Egypt, and certainly no occasion to engage in it.

Many copper and bronze daggers have been found on Crete, but they were hardly intended for battle. In Keith Branigan's catalogue of 422 metal daggers from the Early and Middle Bronze Age Aegean (down to ca. 1700 BC), very few come from the Greek mainland, more come from the Cyclades islands and still more from Troy. At least 80 percent, however, come from Crete (especially from burials at Hagia Triada and Platanos), and mostly from the EM period.⁷² Although the statistic is impressive, it is not evidence for warfare on Crete in the third and early second millennium BC. Like the "battle-axe" in temperate Europe, the dagger seems to have been a common side-arm for adult men on Crete at that time, just as it was in the Levant.⁷³ Unlike the dagger, the spear was a military weapon, but only a handful of spearheads—none of them socketed—have been found in Middle Minoan contexts.⁷⁴

Crete in the Middle Minoan period has often been described as a peaceful contrast to the Near East. The contrast is certainly there, although Minoan Crete now appears not quite so peaceful as it did 100 years ago. Nanno Marinatos has argued that Minoan art (and especially what is portrayed on stone or metal rhyta) seems to have emphasized the preparation of young Cretan males for some kind of military activity.⁷⁵ On the basis of the unwalled palaces found at Zakros, Mallia, Phaistos and especially Knossos, it is widely—and probably correctly—assumed that in the Protopalatial period of Crete a Great King ruled the island and dominated the Aegean. On the traditional low chronology (disregarding the high carbon date for the Santorini eruption) the MM II period ended ca. 1700 BC, when an earthquake badly damaged the Knossos and other palaces and so brought the Protopalatial period to an end. The Great King on Crete in the Protopalatial period must from time to time either have waged war or have simply intimidated small communities into subjection. The second alternative must have been more frequent than the first. Cretan rulers projected their power into the islands of the Aegean and along the coasts of the Greek mainland and southwestern

Anatolia. A Cretan colony had been established at Kastri on the island of Kythera already in the EM II period, but early in the second millennium BC—by which time state formation was well along—the Cretan connections with Kastri were intensified.⁷⁶

The rulers of Crete relied upon their ships to subjugate islands in the Aegean and valuable coastal areas of the Greek and Anatolian mainlands. Although it is not likely that the Cretans fought sea battles, their ships carried spearmen and so were indeed the basis of a thalassocracy. At the Kolonna site a shoulder frieze on an Aiginetan barrel jar shows oared long ships, with spearmen aboard.⁷⁷ Were two or three such ships to sail into a harbor, the residents along the harbor may have had little choice but to acquiesce to the commander's orders. Remarking on the fortifications on two islands, and on the depiction of ships carrying spear-bearing men, Sturt Manning came to the conclusion that by the Late Minoan I period Cretans had tight control of much of the Aegean: "It would seem plausible that the LM I Minoan stability and prosperity were a function of Minoan dominance of this area. This dominance, whether military, hegemonal, or merely commercial, was clearly dependent on sea power, even if battles were fought on land."⁷⁸ Even the lack of fortifications at Knossos and the other palaces in Crete may, as Manning supposed, be a sign that at home the Cretans—like unwallled Sparta in the fifth century BC—had nothing to fear.

Outside of Troy, the only walled towns in the MB II Aegean appear to have been at Ayia Irini on Keos, at Kolonna on Aigina, and possibly at Miletus. It is likely that the walls were put up by Cretans in order to establish strongholds from which they could control the surrounding communities.⁷⁹ An important source of wealth in Protopalatial Crete was metallurgy: the making of silver, gold and especially bronze artifacts of high quality.⁸⁰ The metal artifacts ranged from long bronze rapiers to tiny and exquisite pieces of gold jewelry. Where their tin came from remains a question, but copper was not far away. Some of it came from Crete itself, more came from Cyprus, but it is quite certain that in the MM II and III periods and in LM I the Cretans got much of the copper and all of the silver they needed from the Laurion mines on Attika's southeastern coast.⁸¹ In order to facilitate and protect this trade the rulers of Knossos established a colonial outpost on the northwestern coast of Keos, the island lying 12 miles off the shore of southeastern Attika. The outpost, at what is now the town of Ayia Irini, was fortified early in the MM period and in Period V of the site (MM III, ca. 1700—1600 BC) the fortifications were substantially improved.⁸² The settlement reached its zenith in Periods VI-VII, when Cretan connections were still very strong. Fresco fragments of a procession and dancing at a religious festival show something of the sophisticated life of the islanders.⁸³ Evidently inland Attika was also to some degree "subject" to Knossos. Such a relationship plausibly lies behind the myth that the Athenians were required to send a regular tribute—seven youths, and seven maidens—for sacrifice to the Minotaur in his Labyrinth.

On the island of Aigina, off the southern coast of Attika, substantial fortifications and a rich burial at Kolonna hill show how important this site was in the MM II period.⁸⁴ As described by Louise Schofield,

at the main gate of the fortification wall at Kolonna on Aigina, lying in a large cist grave, a warrior was found wearing a gold diadem and equipped with a fine set of weapons (a long sword, spear and obsidian arrowheads). Also in his tomb were placed a boar's-tusk helmet, a bronze razor and pottery, both local and imported.⁸⁵

Like their colony at Ayia Irini, the Kolonna community is very likely testimony to the Cretan kings' interest in—and control of—the opposite coastlands. These were the northern Argolid and the eastern coast of the Corinthian Isthmus, as well as southeastern Attika with its copper and silver mines at Laurion. The so-called Large Building Complex at Kolonna—measuring at least 300 square meters, or many times the size of the average house—dates to the MM II period, as does the so-called “Shaft Grave” with its impressive array of grave goods. Kolonna had been fortified already in the EC II period, one of the very few fortified sites in Greece or the islands at that time, but early in the MM period the fortifications were extended and redone, and various “Minoan” imports and technologies indicate the presence of Cretans on the island. The “Aigina treasure,” which emerged at the end of the nineteenth century and has been in the British Museum ever since, reflects the wealth of the rulers of the island, unparalleled on the mainland. MM Ayia Irini and Kolonna must reflect the dominance of Crete over the islands to its north.⁸⁶ It is unimaginable that native Keians and Aiginetans could have erected the fortifications in defiance of the Cretan king, and that for several hundred years the Cretan kings allowed the defiance to continue.

With no walled cities for Cretan kings to subdue, there was no place for the kind of siege warfare that was familiar in the Near East. The so-called “Siege Rhyton” from Shaft Grave IV at Mycenae, almost certainly a Cretan vessel, does not portray Cretans conducting a siege and is not so early as the eighteenth century BC.⁸⁷ The wars fought by a Cretan king in the MM I and II periods were probably limited to punitive campaigns against poorly organized troublemakers, some on the islands and others on the mainland.

Long thrusting swords—rapiers—were seen in the Cretan palaces during the Middle Minoan period, but evidently they were meant to display the position and power of the rulers rather than to be used in battle. Perhaps the least serviceable of the rapiers recovered by archaeologists was one found almost 100 years ago by the French excavators of the Mallia palace. Precariously hilted, with no tang, the blade was attached to an organic hilt by four rivets through a flat “grip plate.” In her catalogue of early Aegean swords Imma Kilian-Dirlmeier dated this *Griffplattenschwert* to the end of the MM II or to the MM III period.⁸⁸ Two other rapiers found in the Mallia palace also date to the end of the MM II or beginning of the MM III period.⁸⁹ These are hilted with a tang rather than a grip plate, and were classified by Georg Karo as Type A swords. One of the Type A rapiers from Mallia was hilted with ivory and gold and on neither of the rapiers was the hilt secure: the bronze blade was attached to an organic hilt by a short tang, with two rivets through the tang and two more through the rounded shoulders of the blade. Perhaps slightly later than the Mallia rapiers, although roughly contemporary with

them, is the Type A rapier found in 1981 at Kolonna.⁹⁰ This prestige sword, from the rich "Shaft Grave" of the MM (or MH) II period, was topped by an ivory and gold pommel. Its hilt was more secure than that on the Mallia rapiers: the hilt was fastened to the blade by five rivets across the shoulders, and by two more in a rather short tang. Although swords had enormous potential in battle, these early rapiers seem still to have served as status symbols or ceremonial objects rather than as practical weapons.

Most impressive, because of their numbers, are the Type A swords found 100 years ago in the Arkalochori cave in central Crete. A hoard deposited in the cave included, in addition to more than twenty small gold and silver double-axes, dozens of bronze rapiers, some of them ornately engraved.⁹¹ The swords were probably cast in a foundry at the palace at Galatas, 2 miles from the cave, and probably during the MM III period.⁹² Perhaps in a time of danger the palace's treasures were hidden away in the Arkalochori cave, and the owners and their servants did not live to recover the hoard.⁹³ How many rapiers there once were is uncertain: many of them were broken, and the cave was partially looted before archaeologists arrived on the scene to make an inventory.⁹⁴ The Arkalochori rapiers were obviously not intended for use. Because the stubby tangs have no rivet holes at all, an organic hilt may have been fitted to the bronze but could not have been attached to it. From the evidence now available we may surmise that in the Middle Minoan period rapiers were conspicuous in the rituals and ceremonies that took place in the Cretan palaces. Rapiers must also have been carried by men of distinction: the specimen from Kolonna was found lying parallel to the man buried in the "Shaft Grave."

Swords were very rare in the eighteenth century BC, and the Cretan rulers were unusual in acquiring and displaying considerable numbers of them. It is debated whether already in the third millennium BC a few privileged men in the Aegean may have carried a sword rather than a dagger. That possibility rests on three decorated swords reportedly from Amorgos, the island from which so many Cycladic figurines came to European and American collectors and museums.⁹⁵ The Amorgos swords have been dated by some to the third millennium BC, but their casting in tin bronze makes this doubtful.⁹⁶ Although the Amorgos swords have been considered to be precursors of the Middle Minoan Type A rapier, there are more likely antecedents further afield. Barry Molloy is correct in saying that in the Aegean world "the Type A sword appears virtually fully formed in Middle Minoan (MM)/Middle Helladic (MH) II."⁹⁷ Fifty years ago Nancy Sandars supposed that, although the rapiers had some features anticipated by daggers in use on Crete and the Cycladic islands in the EB III period, an important prototype for the Mallia rapiers was a sword found at Byblos: because the hilt is similar, as is the pronounced central rib on the blade, northern Levantine influence probably helped to shape the Aegean rapier. Shortly after Sandars' publication, Keith Branigan argued that the Byblos sword was made on Crete and imported to Syria, and that the rapier tradition originated in the Aegean and for a long time was confined to the Aegean.⁹⁸ More recently Imma Kilian-Dirlmeier agreed with Branigan that rapiers were an Aegean innovation.⁹⁹

Apparently, however, the argument must look far beyond the Byblos rapier and the Aegean. As will be set forth in detail toward the end of this chapter, Type A rapiers (see Figure 3.3) considerably earlier than either the one from Byblos or the many from Crete (to say nothing of those from the Mycenaean Shaft Graves) have been found much further to the east: in kurgans and other burials south of the Caucasus. How the rulers of Crete could have learned about the Type A rapiers of southern Caucasia is unknown, but one possibility is fairly obvious. Late in the MM/MH II period, that is, the rulers at Knossos may have begun employing a few south Caucasian chariot crews, to help with policing Crete and the coastlands opposite Kolonna and Ayia Irini.

Along with the Middle Minoan rapier in the rich grave at Kolonna was a boar's-tusk helmet, or more specifically plates that had been sawn from boars' tusks, and then had been perforated on both ends and sewn to a leather cap. The tusks of many boars were required for the making of one such helmet,¹⁰⁰ and the man who wore the helmet was obviously a person of importance. Helmets made from boars' tusks came dramatically into fashion in the Aegean toward the end of the Middle Bronze period, but they may have been preceded by decorative artifacts that included boar's-tusk plates. In her excavations at Eutresis, Hetty Goldman found perforated boar's-tusk plates on the floor of an MH II house, and although she suggested that "[t]hey doubtless came from a leather helmet, like the boar's-tusk helmet of Mycenae,"¹⁰¹ it is not certain where they came from. George Mylonas found the remains of what he thought was a boar's-tusk helmet, along with a dagger, in a "warrior's grave" at Eleusis that pre-dates the Shaft Grave period, but a recent review raises doubts whether the fragments of boars' tusks came from a helmet, and whether indeed the man buried in the grave was a warrior.¹⁰² The boar's-tusk helmet has been described as an Aegean invention, and Cretan commanders may well have been the first to wear them. Long before boar's-tusk helmets were worn in the Aegean, however, boar's-tusk plates had been worn along the northern shore of the Black Sea and the Sea of Azov, surely for decoration and ostentation rather than for protection in battle.¹⁰³

The boar's-tusk helmet and the Type A rapier tell us that on Crete and in the Aegean islands some kind of military display had become important by the end of the Middle Minoan II period. Such ostentation, however, is not necessarily evidence for warfare. The absence of fortification walls at the Cretan palaces suggests that the MM II rulers had no worries about war close to home. Their control of the Aegean islands and some coasts of the Greek mainland may have depended, for all we know, on the display rather than on the exercise of military power.

Warfare on the Greek mainland in the Middle Helladic period

It appears that on the Greek mainland—unlike in the Cretan palaces or in Cretan outposts abroad—any kind of military display was very rare through most of the Middle Helladic period. As mentioned above, in his survey of Aegean bronze artifacts from the Early Bronze and Middle Bronze (before the Shaft Graves)

periods, Branigan catalogued more than 400 Aegean daggers. Scarcely a dozen of these were found on the Greek mainland.¹⁰⁴ While the dagger was a personal weapon, the spear was potentially a military weapon, and before the Shaft Grave period very few men on the Greek mainland seem to have owned a spear. Branigan counted more than fifty Aegean spearheads, but of these only two—one from EH Lerna and one from MH Sesklo—come from the Greek mainland.¹⁰⁵ The Sesklo spearhead reappears in Robert Avila's catalogue of some 200 bronze spearheads from the Greek *Spätbronzezeit*, and is the only entry in Avila's long catalogue that seems to date from before the Shaft Grave period.¹⁰⁶ The Sesklo spearhead was "shoed," a not very effective method of attaching a metal head to a wooden shaft,¹⁰⁷ and the founder's mold discovered in the Sesklo cemetery shows that someone in MH Thessaly was making "shoed" spearheads. The type may have originated along the Adriatic (of the seven known to Avila, one came from the island of Lefkas and two from Albania),¹⁰⁸

Fifty years ago R. J. Buck summarized what evidence had been found for war and warriors on the Greek mainland before the Shaft Grave period:

The Middle Helladic people certainly possessed weapons, but comparatively few bronze ones have been discovered, if we except the rich finds from the Shaft Graves of the very end of the period. The bow and arrow were employed; for obsidian arrow-heads and stone arrow polishers and straighteners occur not infrequently. A fairly short bronze dirk or dagger, sometimes with a pommel, is found occasionally; it may have Cycladic affinities.¹⁰⁹

Excavations in the last 50 years have not much changed Buck's characterization of MH Greece. The 1046-page *Mesohelladika* volume published in 2010 includes sixty-three papers on MH Greece,¹¹⁰ but none of the papers deals with weapons. In her contribution to the volume Maria Kayafa analyzes the 260 metal objects that she has catalogued from the MH Peloponnesos before the Shaft Grave period. Half of the copper-based objects are ornamental, another third are either personal implements or tools, "while the rest of the finds constitute small minorities." The weapons Kayafa mentions are a few daggers and one sword.¹¹¹

The discoveries on Keos and Aigina are spectacular, but they tell us not about the Greek mainland but about Cretan rulers' ambitions to control valuable resources, and in particular the mines at Laurion. More problematic is a cist grave with a warrior burial discovered in 1982 at Thebes. The burial has been seen by some as earlier than the Shaft Graves of Mycenae.¹¹² The warrior at Thebes was buried with a Type A rapier (0.86 m long), a spear, at least five arrows (and therefore also a bow), the arrows having heads of flint and obsidian, and evidently a boar's-tusk helmet. That is the same "kit" of weapons and helmet found in the rich MM II burial at Kolonna on Aigina. If the two burials are of the same date, I would suppose that the "warrior" at Thebes was also the local chief, serving the ruler at Knossos, and possibly the commander of a small chariot unit. Although the Theban burial is regarded by some as dating to the MH II period, it is more

often placed at the very end of the MH period, making it contemporary with the earliest Shaft Graves in Circle B at Mycenae. Maria Kasimi-Soutou, who published the grave, dated it to the transition from MH III to LH I.¹¹³ Katie Demakapoulou put it still later: at the beginning of the LH period.¹¹⁴ A date in the MH II rather than the late MH III or very early LH I period for the Theban burial depends in part on the spearhead,¹¹⁵ which must be added to the “shoed” specimens known to Avila. Although the shoed spearhead is attested for the MH period, it evidently survived into the Mycenaean period. One of the seven in Avila’s catalogue came from Shaft Grave IV at Mycenae, showing that well into the LH I period a shoed spearhead was occasionally seen.¹¹⁶

Unless an early dating of the Theban tomb can be established, the fortifications and weapons on the offshore islands of Aigina and Keos are virtually the only indications we have that at least parts of the Greek mainland would have been familiar with some kind of military presence in the MH (or MM) II period. If the towns at Kolonna and Ayia Irini were subject to a king at Knossos, as is very likely, he must have installed vassals to control the islands and also to police the opposite coastal areas. Each vassal may have had a troop of spearmen at his disposal and ships to take them wherever on the nearby coasts trouble was brewing or military coercion was required. And I will suggest that both vassals, and also—if he did indeed live in the MH II period—the man so impressively interred at Thebes, may have employed several chariot crews to help them keep the peace in their mainland bailiwicks.

Violence in temperate Europe in the Neolithic period

Although violence in temperate Europe is well attested by osteological evidence for the Neolithic period, warfare is another matter. Evidence for massacres of men, women and children early in the Neolithic period suggests that in temperate Europe hostility between foragers and food-producers may have occasionally erupted into violence. An atrocity at Talheim, in southern Germany, left the skeletons of thirty-four individuals, most of them women and children, and all apparently killed by an axe. Another massacre, at Schletz bei Asparn, in Austria, claimed at least fifty victims, of both sexes and all ages. These atrocities occurred between 5000 and 4500 BC and the victims are identified with the Linearbandkeramik culture of central Europe.¹¹⁷ The bow and arrow were of course used most often in hunting, but osteological evidence leaves no doubt that humans were also targets.¹¹⁸ For the British isles, R. J. Mercer concluded that “the archaeological evidence for warfare is generally clearer during the Neolithic than at any time in Britain prior to the Roman period.”¹¹⁹ Violence continued throughout the Neolithic period. According to Jean Guilaine and Jean Zammit, “the vast majority of human remains bearing projectile-inflicted injuries date from the later stages of the Neolithic, between 3000 and 2000 BCE.” That datum is qualified, as the authors concede, by the fact that in temperate Europe archaeologists have found far more graves from the third millennium BC than from the fifth or fourth.¹²⁰

Grim evidence for violent death in the Corded Ware culture came recently with the discovery, in 2005, of four graves at Eulau, in Germany's Sachsen-Anhalt state.¹²¹ In the graves were thirteen skeletons, with cranial trauma showing that most of the victims were struck from behind with battle-axes as they were trying to escape from their attackers. The victims were two men (one of whom had a flint arrowhead imbedded in a lumbar vertebra), three women, and eight children, ranging in age from 1 to 9 years old. It is obvious that late in the third millennium BC a settlement near Eulau was devastated by a raid and a massacre.

The Corded Ware culture of the third millennium BC has often been called the "Battle-Axe culture," because a battle-axe was commonly placed in the grave of a male (in the burials at Eulau, stone axes were placed with the bodies of the men and boys). We must assume that in the vast Corded Ware culture, which stretched from near Nizhny Novgorod (far to the east of Moscow) westward to the Rhine, a man frequently went about with a battle-axe suspended at his side. Wielded with one hand, the "battle-axe" surely was used more often against animals than against humans, and that it was intended for battles has never been clear and—I suggest—is not likely. Until we have evidence to the contrary, that is, the "battle-axe" should despite its name be regarded as a personal weapon rather than as a weapon designed for battle. The axe had a stone head, often in the shape of a boat, with a shaft-hole for attachment to a wooden handle that was perhaps 40 or 50 cm in length. However useful they may have been for personal defense, neither the axe nor any other weapon available in the Corded Ware or the Beaker culture seems to have been designed for combat: designed, that is, for a confrontation with opponents who were also prepared and equipped for combat. The dagger would have been no more effective in combat than the axe. Through the third millennium BC daggers were usually made of flint: a flint 20 or 25 cm long was on one end shaped into a pointed and sharpened blade, and on the other end was rounded into a handle and then wrapped with osiers impressed into a coat of tar.¹²²

Because of the ubiquitous axes, the Corded Ware culture has for a long time been thought of as warlike. Gimbutas imagined men of the Corded Ware (as well as the Bell Beaker) culture as "vagabondic horse riders and archers" who were frequently at war.¹²³ Evidence for war, however, has not been found.¹²⁴ Like mainland Greece and unlike the Near East, temperate Europe was in the Neolithic period at neither the state nor the urban level. The siege warfare that characterized the Near East could obviously not have happened here. Homicide was of course a danger, and from time to time there were sudden raids and sneak attacks on villagers. Skirmishes, with exchanges of arrows shot from self bows may also have occurred, because arrowheads are often found as grave goods in the Beaker period and some men were buried with arrowheads lodged in their vertebrae. Many Europeans died a violent death in the Neolithic period, but it is likely that most of the trauma found on skeletons resulted not from combat between armed opponents, but from crime, personal revenge, and the massacre of people who were unsuspecting and unarmed.

Violence in temperate Europe in the Early Bronze Age

In central Europe the Early Bronze Age began ca. 2200 BC and is usually divided into two phases: Bz A1 (ca. 2200–2000 BC) and Bz A2 (ca. 2000–1600 BC).¹²⁵ In the historical chronology used in this book those dates will be lowered 100 years. That warfare (in contrast to other forms of violence) was familiar to Europeans through most of the Early Bronze Age has again been assumed but again is not clear.¹²⁶ We are fortunate that a masterful survey of weapons for the period has recently been published by Anthony Harding.¹²⁷ Although I am not persuaded by all of Harding's generalizations, his command of the particulars is unsurpassed.

Although violence continued to be familiar to Europeans early in the Early Bronze Age, I doubt that it often—if ever—rose to the level of an organized hand-to-hand battle: an engagement, that is, between opposing forces, each of which was armed and prepared to fight hand-to-hand. Whether anything that we would describe as a war was fought in Europe during the Early Bronze Age is even more doubtful. The absence of defensive armor—helmet, corselet, greaves—is not surprising, because even in Egypt and Mesopotamia metal armor had not yet come into use. The lack of any evidence for shields may be more significant,¹²⁸ but most significant is the limited set of offensive weapons. The main hand-to-hand weapon in Neolithic and Chalcolithic Europe had been the axe, and that continued to be the case through much of the Early Bronze Age. Although bronze was now available, Europeans continued to make their arrowheads of flint or some other chipped stone. The short tang of the arrowhead was simply pressed into the wooden shaft.¹²⁹

The Early Bronze Age in central Europe began with the Únětice (or Aunjetitz) archaeological culture ca. 2200 BC. With it also began the practice of including a bronze dagger among the grave goods to accompany the deceased into the Underworld. Harding found in this practice “the rise of the warrior” in temperate Europe. According to his statistics only about 3 or 4 percent of adult male burials included a bronze dagger, and so small a percentage may suggest that these men were a warrior elite.¹³⁰ I will argue, however, that the man buried with a dagger in central Europe was not a warrior but simply the proud owner of a bronze dagger. Supporting the latter possibility is the finding of daggers in the graves of a few elderly women and even of children.¹³¹ It had long been a common practice of adult males in the Levant and on Crete to wear a dagger, and these were not warriors but “ordinary” men.¹³² In the tin bronze economy early in the second millennium BC the practice evidently spread to temperate Europe, but there—in contrast to Crete and the Levant—only a few men of the period were rich enough to carry to the Underworld the daggers they had proudly worn in their lifetime.

In temperate Europe and Italy the dagger and the axe are the only hand-to-hand weapons attested in the early second millennium BC. Clubs and fire-hardened wooden spears may also have been in use, but they are not archaeologically detectible. It is difficult to imagine that well into their Bronze Age Europeans were fighting in organized battles—as opposed to brawls, mayhem, or surprise attacks on unarmed villagers—in which the only hand-to-hand weapons made of metal

were hatchets and daggers. No swords from this period have been found in Europe, but they are not expected because in the eighteenth century BC the only swords known in the Near East and the Aegean were the status symbols worn by men in the elite class.

Much more telling is the absence in temperate Europe and Italy of spears, because the spear was more effective in battle than the rapier and far less expensive. According to Harding, “the spear seems to have entered the world of Bronze Age Europe at the end of the Early Bronze Age.”¹³³ Metal spearheads had been in use in the Near East since ca. 2500 BC, and by the end of the third millennium BC the tanged version was beginning to be replaced by socketed spearheads. On the Greek mainland a very few shoed spearheads—less securely attached than the socketed, but superior to the tanged—were evidently in use in the MH period. Temperate Europe was therefore remarkably laggard in having no metal spearheads of any kind until well into the second millennium BC. Smiths and founders in the Únětice archaeological culture had been producing a wide variety of bronze artifacts since ca. 2200 BC. If battles were being fought in central Europe in the seventeenth century BC, metalworkers should by that time have long been producing bronze spearheads, whether socketed, shoed or merely tanged. Only toward the end of the Bz A2 period did the metal spearhead—socketed—and the sword appear in temperate Europe, and we shall look at those innovations in Chapter 5. Harding is certainly correct in saying that it was only during the course of Europe’s Bronze Age that “for the first time, weapons were developed for the sole and specific purpose of killing humans rather than animals.”¹³⁴ Another way of saying this is that until late in the Bz A2 period Europeans were not equipped, and therefore not expecting, to go into battle.

Such settlements as have been found are frequently on hills, and in many cases the inhabitants must have deemed the elevation itself sufficient protection. At other hill sites archaeologists have found evidence that the settlement was surrounded by a wooden fence or a palisade. “If additional strength was required,” Harding writes,

the provision of a modest ditch and bank at certain weak spots might be all that was required—and indeed it can frequently be seen that “defences” did not completely encircle sites, but were confined to small areas. The next logical step, that of providing a full set of defensive barriers, was one taken in the Late Bronze Age and more especially in the Early Iron Age.¹³⁵

In northern Italy, along the foothills of the Alps and usually at an altitude of several hundred meters, hundreds of *castellieri* have been identified.¹³⁶ Although surrounded by stone walls these installations seldom show any sign of occupation. They are more likely to have served as sheepfolds, with walls to keep the wolves away, than to have had any military purpose.

Temperate Europe was not necessarily a peaceful society in the early second millennium BC. Certainly many men possessed a weapon: a bow, an axe and

occasionally a bronze dagger. Atrocities occurred from time to time, as wrongs or perceived wrongs were avenged by massacres. The general lack of fortifications, however, together with the primitive state of weapons and—as everywhere else—the absence of any defensive armor, suggests that in Europe battlefield warfare had not yet begun in the early second millennium BC and the idea of an army had not yet been conceived.

Warfare ca. 1700 BC: The Indus valley

Sir John Marshall and Sir Mortimer Wheeler—both of whom directed excavations at Mohenjo-daro—concluded that warfare was rare, and perhaps altogether absent, in the earliest civilization of the Indus valley. The excavators and Stuart Piggott, whose *Prehistoric India to 1000 B.C.* presented what had been learned in the first half of the twentieth century, all found “a distinct lack of evidence for warfare. Where were the arms? Where was the enemy?”¹³⁷ Archaeological discoveries in the seventy years since Wheeler’s time have hardly changed that perception. Recently an attempt has been made to identify weapons among the many bronze artifacts found at Harappan sites, but the results are not very impressive.¹³⁸

The apparent peace of the Mature Harappan period (ca. 2500–1900 BC) is in sharp contrast to Akkadian and Neo-Sumerian Mesopotamia, with which the Indian cities seem to have been in contact. The Indian cities were not fortified. Even the two “citadels”—one within Harappa and the other within Mohenjo-daro—identified by the early archaeologists are now thought to have been something other than citadels or fortresses.¹³⁹ The abandoning of Mohenjo-daro and many other sites on the lower Indus ca. 1900 BC, and the transition to Late Harappan, were not the result of hostilities.¹⁴⁰ It seems that in the Asian subcontinent warfare did not really begin until well into the Late Harappan period (1900–1400 BC).¹⁴¹

Warfare ca. 1700 BC: The Eurasian steppes

Early in the second millennium BC warfare—at least on a small scale—was apparently more familiar in the Eurasian steppes than it was in India, temperate Europe and the Greek mainland. On the steppe, unlike in the Near East, combat may have occurred more often in the open country than on the siege ramp. A fortification wall on the forest steppe was mostly earth, with reinforcing timbers, and was probably no more than 5 or 6 m high. It is also relevant that early in the second millennium BC the steppe dwellers had apparently begun to use chariots in battle. Even late in the third millennium BC, however, and so before the first chariots were built, the steppe dwellers seem to have been familiar with battles.

Between the upper Don and the middle and upper Volga, some 700 miles north of the Caucasus, were settlements and kurgans assigned to the Abashevo culture.¹⁴² Mortuary evidence of warfare was found here under a kurgan erected early in the Abashevo period. A long pit-grave at Pepkino, on the Sura river, held the skeletons of twenty-eight young men, many of them decapitated. As described by

Ludmila Koryakova and Andrej Epimakhov, “traces of injuries—broken bones and skulls pierced with metal weapons and stone arrowheads of the Balanovo type (see later)—were detected on the bones of a large number of these skeletons.”¹⁴³ That the dead were all young males must mean that they were not victims of a massacre or a raid, but casualties in a battle. That their bodies were collected and honored with a burial under a kurgan suggests that their comrades may ultimately have been victorious in the battle, and that the community to which they belonged—perhaps a chiefdom—included several hundred men. In the Pepkino battle bows and arrows were obviously important. The main hand-to-hand weapon may have been an axe, but this battle occurred early (ca. 2200 BC) in the Abashevo period. Later in the Abashevo culture, at settlements and in graves of the early second millennium BC, socketed spearheads were found along with an array of other weapons. Anthony’s generalization is worth noting: “Intense warfare, perhaps on a surprising scale, was part of the political landscape during the late Abashevo era.”¹⁴⁴

Some indirect evidence for warfare in the steppe, dating early in the second millennium BC, may have recently come from the Timber Grave (Srubna, or Srubnaya) archaeological culture, to the west of the Urals and south of the Abashevo culture. David Anthony and Dorcas Brown excavated a tiny Srubna settlement at Krasnosamarskoe, on the Samara river close to its inflow into the Volga. In a deep kitchen midden within the largest of the settlement’s three structures were thousands of animal bones.¹⁴⁵ Not surprisingly, many of the bones came from cattle and ovicaprids, but what greatly surprised Anthony and Brown was that no less than 40 percent of the bones came from dogs (in the typical Srubna settlement dogs account for no more than 2 percent of the bones). The dogs were apparently sacrificed, butchered and probably eaten in a ritual that came round every year in midwinter.¹⁴⁶ Anthony and Brown suggest that the large structure served for gatherings of people from many villages roundabout, and that the sacrifice of dogs was part of a ritual at which adolescent boys were initiated into manhood. The archaeologists reconstruct such a ritual on the basis of the Lupercalia of the early Romans and of several other rituals attested in Indo-European societies. Recalling the *krypteia* of the Spartans, the *Männerbünde* of Germanic societies, and the *Vrātyas* of the Rig Veda, Anthony and Brown propose that the purpose of the ritual at Krasnosamarskoe “was to initiate young men into the warrior category.”¹⁴⁷

Apparently the Sintashta culture in the “Country of Towns,” just to the east of the southern Urals, was also familiar with warfare. Archaeologists have found twenty small towns (or large villages) here, most publicized of which is Arkaim in the Chelyabinsk Oblast. Each of the towns was completely encircled by a fortification of mounded earth and a timber palisade. While a far cry from fortifications in the Near East, the mounds and palisades would nevertheless have offered at least temporary protection and they suggest that the men of the town expected that they would have to defend it. This is also implied by the weapons found in cemeteries. Neither here nor elsewhere on the steppe have rapiers been found in early second-millennium contexts, but that is not surprising because they

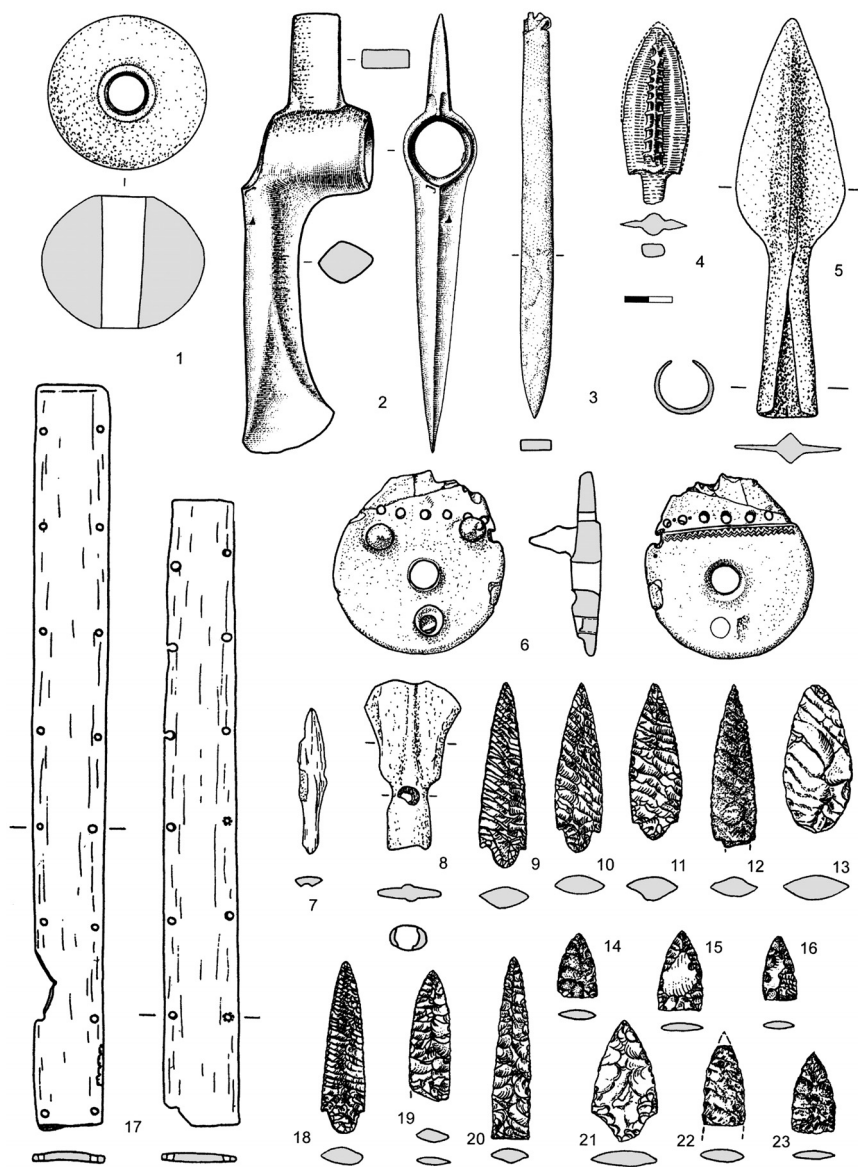


Figure 3.2 Weapons and armor from Sintashta-Petrovka sites. 1 mace. 2 axe. 5 socketed spearhead. 6 studded disk cheekpiece. 4, 7-16 and 18-23 arrowheads. 17 bone "armour parts." From Bersenev, Epimakhov and Zdanovich 2011, Figure 2. Courtesy of *British Archaeological Reports* and of Andrej Epimakhov

were just beginning to serve as status symbols. In the same Sintashta graves, however, that yielded horse sacrifices, cheekpieces, and some of the earliest spoke-wheeled carts, archaeologists found many and various weapons and even what seem to be panels of armor.¹⁴⁸ Arrowheads were stone, but the hand-to-hand weapons were made of arsenical bronze (tin bronze was not yet produced in the southern Urals).

If the Russian archaeologists have correctly identified the panels of bone as “armour parts,” to be sewn on a leather or cloth corselet, the panels would be the clearest evidence for battle and for a warrior class.

The presence of spoke-wheeled carts and of a warlike society may not be a coincidence. Philip Kohl believes that not all of the “chariots” at Sintashta would have been too small for use in battle:

The larger ones could have accommodated both driver and warrior, but the quarters still would have been somewhat cramped. The abundance of arrowheads found in the graves at Sintashta suggests the increased importance of archery at this time. Individuals or materials could be transported quickly over longer distances using such carts/‘chariots,’ and their ownership and use probably conveyed social prestige. Certainly, the numerous weapons (Figs. 4.15 and 4.16), such as socketed spearheads, axes with secondary blades on projecting butts, tanged knives, stone mace heads, flint and bronze arrowheads, and longer projectile, possibly javelin, points (4–10 cm. in length) are eminently functional, not just prestige ceremonial items, and imply increased militarism, a trend that continues throughout the Late Bronze Age into the Iron Age and is not only characteristic of the steppes, but also of the Near East.¹⁴⁹

The weapons normally used on the steppe to kill an opponent in hand-to-hand battle were the spear and the shaft-hole axe. The axes carried at Sintashta ca. 2000 BC were not much different in design from those carried in the Carpathian basin three or four centuries later. The presence of socketed spearheads at Sintashta is also worth noting because they were everywhere still a novelty at this time, and west of the Carpathians metal spearheads of any kind were not yet in use.

Although self bows may have been commonly used on the steppe, archaeologists have detected the presence of composite bows at Sintashta and nearby sites. Of the forty-six graves excavated at the Kamennyi Ambar settlement, eight had bone or horn strips that are believed to have come from composite bows (the graves also yielded 237 arrowheads).¹⁵⁰ That composite bows may have been known in the southern Urals at this time is not surprising, since they had been known in the Near East through most if not all of the third millennium BC. There and then, however, they had been reserved for the privileged (the wooden figurines in the Tomb of Mesehti all carry self bows). What is surprising at Kamennyi Ambar is that one man out of every six seems to have owned a composite bow. We have reason to think that already ca. 2000 BC the “chariots” at Sintashta were used both in hunting and in combat.

Economy and society in the Eurasian steppe changed quite suddenly ca. 2000 BC. At the beginning of the KMK (or Multi-roller pottery culture), which has been found especially along the Dnieper and the Don river systems, at least 200 settlements were built where previously there had been very few.¹⁵¹ The same was true in the Srubna (Timber Grave) archaeological culture east of the Don, as many pastoralists seem to have abandoned nomadism, choosing instead to live in settlements along the major rivers and their tributaries. Most of these little settlements lay in the forest steppe, but some were built in the grassland steppe.¹⁵² The nomadic pastoralism characteristic of the Yamna period of course continued through the Srubna period, but for every known settlement of the earlier culture archaeologists have identified at least ten from the Srubna culture.¹⁵³ The pastoralists do not seem to have settled down in order to become farmers, because the material record indicates that agriculture was of little importance in the KMK and Srubna settlements. As I suggested in Chapter 2, it is possible that chariots made nomadic pastoralism less profitable, and more dangerous, than it had once been. Chariot-borne rustlers and raiders, that is, may have begun to drive off flocks and herds from the open steppe. This surmise must rely entirely on circumstantial evidence. In much of the steppe sedentarization occurred very soon after the invention of the chariot, and the weapons (including composite bows) associated with the chariot burials at Sintashta show at least that the owners of the vehicles were well equipped to engage in raids and razzias.

Warfare in southern Caucasia, to 1700 BC

People in the highlands to the south of the Caucasus mountains, a region long known to Russians as Transcaucasia, seem also to have had considerable acquaintance with warfare early in the second millennium BC. In the lowlands of western Georgia (“Colchis”) this may not have been the case. Small settlements of the period have been found here. These settlements, usually including only a handful of houses, had no fortifications other than the moats that surrounded them and that were probably dug for drainage purposes (the region, as already remarked, receives much more rainfall than it needs).¹⁵⁴ Things were quite different in the higher and drier elevations near and east of the Likhi range. The highlands include the mountainous region of Trialeti, which gives its name to the area’s Middle Bronze II culture, which is now dated to ca. 2100–1700 BC.¹⁵⁵ Although known settlements here are far fewer than those from the preceding Kura-Araxes culture, the few that have been found are larger than their contemporaries in western Georgia. Like their Kura-Araxes predecessors, the Trialeti settlements lay along the Kura and Araxes rivers and their tributaries. Karine Kushnareva called attention to the “defensive systems” found at a number of them.¹⁵⁶ At several sites the fortifications were massive (cyclopean) stone walls and it has been argued that the earliest of them belong within our period, but that seems unlikely.¹⁵⁷

Most of our information about the Trialeti culture—populated mostly by nomadic pastoralists, and similar to the Srubna culture north of the Caucas—comes from the burials. Here the grave goods found in kurgans included flint and

obsidian arrowheads, bronze axes, daggers, rapiers, and socketed spearheads.¹⁵⁸ A find especially informative about warfare was made by Armenian archaeologists in 1987. In excavating a kurgan near the town of Karashamb, in central Armenia, they found the cremated remains of the man for whom the kurgan was raised, the bones of animals slaughtered as grave offerings, and a variety of weapons and other metal objects. The most impressive of these was a silver goblet, evidently of local origin and resembling a silver goblet that had earlier been excavated in Kurgan XVII of the Trialeti kurgans in Georgia. The Karashamb goblet is embossed with scenes of ritual, of combat, and of decapitation.¹⁵⁹ With spears the men depicted on the Karashamb goblet are attacking their enemies, and also important as signals of an organized army are the shields with which the men protect themselves. In the lower register prisoners are being decapitated, a scene reminiscent of the pit-grave at Pepkino, in the Abashevo culture north of the Caucasus.

The military scenes on the Karashamb goblet, and the number of weapons found in burials, suggest to those who have studied the matter that early in the second millennium BC military ambition or pretense was not uncommon among the chieftains or local rulers in southern Caucasia. Christopher Edens sees in the Karashamb goblet and in the similar silver goblet from Trialeti “expressions of a Transcaucasian elite political culture that emulated some symbolic representations of state power borrowed from the south.”¹⁶⁰ Philip Kohl suggests that “[m]ilitarism, as reflected in the arrayed weaponry and depictions of combat and decapitation, appears endemic in the society. Social hierarchy and differential access to power are also clearly evident in these scenes.”¹⁶¹ Adam Smith, who is working with Project ArAGATS in Armenia, sees the Middle Bronze period there as characterized by mobility and militarism. According to Smith, horses and oxen became important in southern Caucasia in the Middle Bronze II period, and both mobile pastoralism and increased violence “appear to have been closely tied to the emergence of radical inequality between a martial elite and the remainder of the social body.”¹⁶²

That chariots were used in battle in southern Caucasia by the end of the Trialeti (Middle Bronze II) period is probable but not demonstrable.¹⁶³ Horse and vehicle archaeology here was for a long time synonymous with what Soviet archaeologists found at Lchashen before the Second World War,¹⁶⁴ and those finds provided little evidence for either horses or chariots before the middle of the second millennium BC. More evidence has been found recently, and although of great interest it is not yet well understood. In 2005 workmen completed construction of the South Caucasian Pipeline, which brings crude oil from the oil fields in the Caspian off Baku northwest to Tbilisi and then southwest to Ceyhan. During trenching in Georgia an archaeological site was exposed at Jinisi, a village 160 km southwest of Tbilisi. This is the first settlement found from the late stages of the Trialeti (MB II) period. The osteological evidence from Jinisi showed that in the eighteenth/seventeenth century BC the inhabitants of the village were eating horsemeat regularly: 35 or 40 percent of the bones found at the Jinisi site were horse bones.¹⁶⁵

Other data comes from the excavations that for more than 30 years Hakob Simonyan has been conducting at Nerkin Naver (“Lower Naver”) and Verin Naver (“Upper Naver”), on the southern slopes of Mt. Aragats in Armenia. At the Navers and at other sites many horse bones from both the Early and the Middle Bronze periods have been found, showing again that the horse was an important food animal, and Simonyan’s recent excavations show that for a person of high status the funeral ritual in the third millennium BC included sacrifices of horses along with bulls and sheep.¹⁶⁶ It is not clear, however, when horses were first tamed—controlled, that is, by a bit—in southern Caucasia. In kurgan N3, which Simonyan and zooarchaeologist Ninna Manaseryan date to the last quarter of the third millennium BC, was found a polished black pot on which are incised six circles, each with four “spokes,” that the authors interpret as chariot wheels.¹⁶⁷ Apparently no organic cheekpieces have yet been found in excavations in southern Caucasia.¹⁶⁸ Simonyan reports that in excavating Kurgan N1 at Nerkin Naver, a kurgan that has been carbon dated to the last quarter of the third millennium BC, he found a jointed snaffle bit made of iron.¹⁶⁹ That would be not only the very earliest bit found anywhere, but would also—as a control for a single horse—suggest riding rather than driving, would precede all other jointed snaffles by 700 years, and would precede all other iron bits by more than 1000. Perhaps the N1 bit will prove to be an Iron Age intrusion in an Early Bronze Age kurgan, just as the complete horse skeleton in N9—carbon dated to the first century BC—is intrusive in a kurgan of the Middle Bronze Age.

More certain evidence for chariots in southern Caucasia comes from Verin Naver, to which Simonyan has recently shifted his attention. In his excavations of a large kurgan there in 2012, Simonyan reported coming upon a cremation burial that had been robbed but contained traces of rich grave goods and also the inorganic remains of a chariot.¹⁷⁰ Simonyan has dated this burial to the beginning of the Late Bronze I period (ca. 1600–1400 BC). The burial apparently included Egyptian faience and fragments of gold leaf from a mask. Of the chariot, only the bronze fittings and appurtenances survive. Bronze hoops indicate that a large leather quiver was mounted on the chariot, and arrowheads—some of red jasper and the others of obsidian—show that sixty-two arrows had been packed into the quiver. That is approximately the number of arrows carried on an Egyptian war chariot in the New Kingdom.¹⁷¹

As now interpreted, the archaeological evidence thus suggests that by ca. 1500 BC chariots were used in combat in southern Caucasia. Textual evidence takes us further. Early in the reign of Hattushili I (who reigned, on the middle Mesopotamian chronology, ca. 1640–1610), several Near Eastern rulers were employing *umman-manda* (“Manda-troops”). In his analysis of Section 54 of the Old Kingdom text of the Hittite laws, Houwink ten Cate showed that the Manda-troops must have been charioteers.¹⁷² “Manda,” from which they came, seems to refer to a mountainous land well to the east of Hatti, and to the northeast of Mesopotamia.¹⁷³ We therefore have some reason to believe that by 1640 BC chariots were being used in battle in south Caucasia. I suspect that there, as along the southern Urals, chariots were so used already in the eighteenth century BC, but for that we have

no evidence other than some questions raised by the “Anitta text,” which dates from ca. 1740 BC.

The beginning of swordsmanship

Apparently it was in the highlands south of the Caucasus that the true history of the sword began, a continuum that stretched from ca. 2000 BC through the European Renaissance. In central and eastern Anatolia swords had from time to time been made already in the early third millennium BC if not the late fourth.¹⁷⁴ These were entirely display-pieces for kings and were not meant for battle. Nor are they known to have launched a continuous tradition.¹⁷⁵ That distinction seems to belong to rapiers that appeared south of the Caucasus at the end of the third and beginning of the second millennium BC. These south Caucasian thrusting swords were of dubious utility, and probably served mostly to advertise the status of the wearer. They were, however, the first generation in a series of swords that in Greece and in temperate Europe (but not in southern Caucasia) became progressively more effective and reliable weapons, and that by the middle of the second millennium BC were in use as far away from their place of origin as Scandinavia and northern Italy. The south Caucasian swords are Type A rapiers, closely akin to those found on Crete and Aigina. Because they were given only passing mention by Sandars, and were not included by Branigan, Kilian-Dirlmeier and Molloy in their discussions of the origins of the Type A, the story of these south Caucasian rapiers will here be given in some detail.

In the 1890s Henri and Jacques de Morgan, exploring along the southwestern shore of the Caspian, found at least four rapiers under tumuli near Lankaran, in the Talysh of Azerbaijan. The de Morgans “excavated” many kurgans there in a very short time, and took much of what they found to the Musée des Antiquités Nationales at Saint-Germain-en-Laye. The de Morgans and Joseph Déchelette, an eminent prehistorian, noticed how similar were the Lankaran rapiers to the Type A rapiers that Schliemann had found in the Shaft Graves at Mycenae, and they concluded that Mycenaean influence had once extended to the shores of the Caspian.¹⁷⁶ In 1948 Claude Schaeffer—who served 15 years as curator of the Saint-Germain-en-Laye museum—included the Talysh rapiers in his *Stratigraphie comparée et chronologie de l'Asie occidentale* and likewise saw them as evidence of Aegean influence in the Talysh.¹⁷⁷ In her fundamental study of early Aegean swords Nancy Sandars noted the similarities of the Talysh rapiers to the rapiers from the Aegean but commented,

The Talish dates still lack a solid foundation, and it is possible that links may appear; but both may be independent developments of the type I dagger, an early example of which was found in the “house-grave” at Tsarskaia, in the Kuban region.¹⁷⁸

Jan Bouzek also discussed the south Caucasian swords and observed their similarities to the Type A Mycenaean and Romanian rapiers. So far as their date

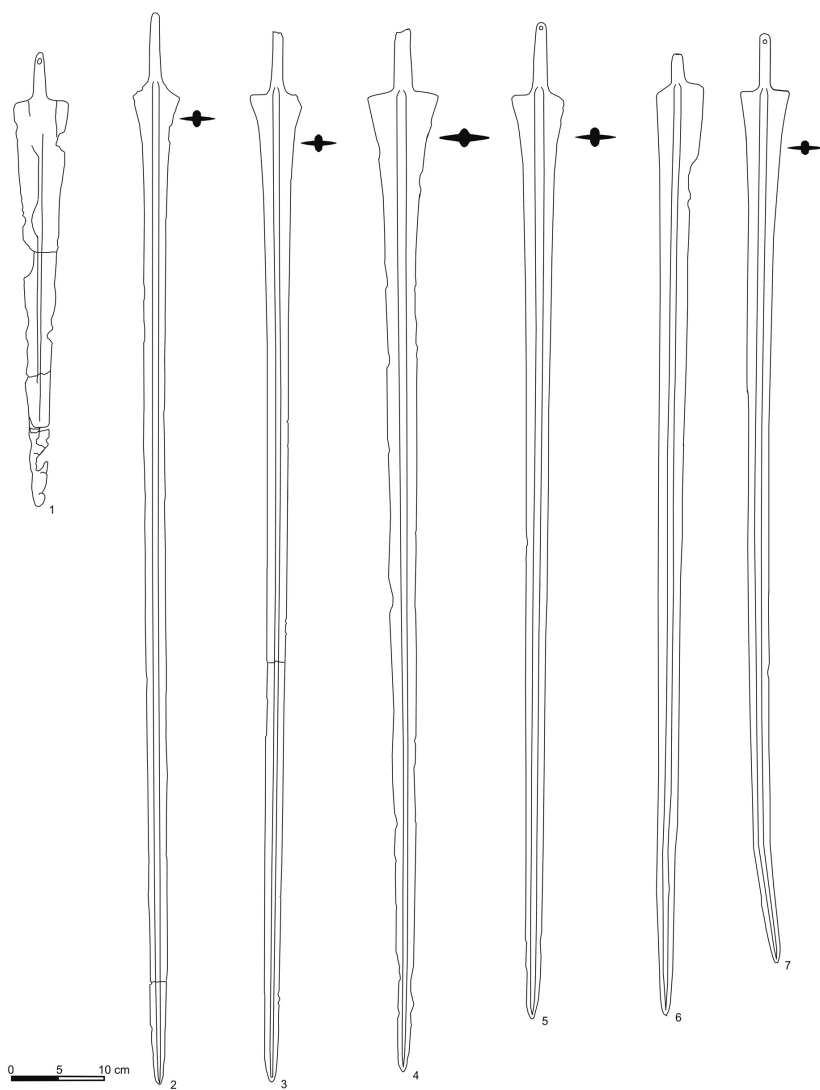


Figure 3.3 South Caucasian dirk and rapiers. 1) Saduga, Kurgan grave no. 2. 2) Mravaltskali, Kurgan grave no. 12. 3) Lilo, Kurgan grave no. 1. 4) Tetri Kvebi, Kurgan grave no. 1. 5) Ghatchaghan, Kurgan grave no. 1. 6) Dzoraget. 7) Samtavro, Kurgan grave no. 243. From Abramishvili 2001, Taf. 2. Courtesy of Mikheil Abramishvili and the Marie Leidorf Verlag

was concerned, Bouzek commented that “Kuftin and some other Georgian and Russian archaeologists date these swords to the 18th century B.C., but a date corresponding to the Shaft Graves period (c. 1650–1500) now prevails in most studies.”¹⁷⁹ Stefan Hiller also saw the similarities between the southern Caucasian rapiers and those from the Shaft Graves, but opined that “since long swords are exceptional in the Kaukasus region an ultimately Aegean ancestry is most likely.”¹⁸⁰ As recently as 1997 Kushnareva supposed that, although the south Caucasian rapiers must have been locally made, their strong resemblance to the swords at Mycenae implies that the Type A rapier had originally been introduced to the southern Caucasus from the Aegean.¹⁸¹

It now appears, however, that either the swords or the influence must have gone the other way. In the century following the de Morgans’ expedition seven more Type A rapiers were found south of the Caucasus (the first of these was found in 1933), and they are more securely dated than the four discovered by the de Morgans. The seven—four from eastern Georgia and three from Armenia, and all of tin bronze—came from kurgans 300 miles to the northwest of Lankaran, and as close to the Black Sea as to the Caspian. They have been studied and published by Mikheil Abramishvili, curator of the Tbilisi Archaeological Museum.¹⁸²

All of the south Caucasian rapiers have a high midrib and are exceptionally long, surely in the expectation that the longer the rapier the better a thrusting weapon it would appear to be. The typical south Caucasian rapier measures 100 cm, and the longest measures 115 cm. For so long a weapon, however, the hilt was very inadequate. As in the four Talysh specimens, in the seven rapiers published by Abramishvili a single rivet attached an organic hilt to a short tang projecting from the blade. The shoulders of the blade on a south Caucasian rapier are horizontal, while the blades of Aegean rapiers have rounded shoulders.

All of the Trialeti rapiers date early in the second millennium BC or late in the third, three or four centuries earlier than the dates that Schaeffer proposed for the similar specimens from the Talysh. Because the south Caucasian rapiers are earlier than those from the Aegean and Byblos, the influence that Déchelette, Schaeffer and others discussed must have gone from south of the Caucasus to the Aegean, and not vice versa. Abramishvili has summarized the relative chronology:

The rapiers of South Caucasia come from the context of artifacts that belong to the second phase of the Trialeti Middle Bronze Age Culture, thus predating even the earliest (A-type) long swords that we know from the ruins of the first palace of Mallia, thus ascribing them either to the end of Middle Minoan II or to the beginning of Middle Minoan IIIb. Furthermore, South Caucasian rapiers have their prototype in the first phase of the Trialeti Middle Bronze Age Culture. The sword from Saduga Kurgan 2 in East Georgia has similar morphological characteristics (except for its length) and is considered as a prototype of South Caucasian rapiers.¹⁸³

The “Saduga sword” to which Abramishvili refers is a stabbing weapon ca. 35 cm in length, and so is more a dirk than a sword. Its characteristics, however, are

quite like those of the rapiers: it has a high midrib and is hilted with a single rivet hole in the tang. It was discovered in 1971, by the Kakheti Archaeological Expedition, in Kurgan 2 on the Saduga plain. Elgudza Gogadze, who excavated the kurgan and wrote a book on the periodization and genesis of the many Trialeti kurgans, dated Kurgan 2 on the Saduga plain to Phase I of the Trialeti Middle Bronze Culture: 2000–1800 BC, on his chronology, but now dated considerably earlier by specialists.¹⁸⁴

In fact, the absolute dates of all phases of the Trialeti Middle Bronze Age are now placed much higher than they once were. Karen Rubinson, in her 1977 study of the chronology of the Middle Bronze Age kurgans at Trialeti, set the region's MB II period at 1850–1700 BC. On the basis of calibrated carbon dates Christopher Edens argued for a much earlier date than either Gogadze or Rubinson proposed: the entire MB sequence in the south Caucasus began in the middle rather than at the end of the third millennium BC.¹⁸⁵ In his 2001 publication Abramishvili placed the Trialeti MB II period in the nineteenth century BC.¹⁸⁶ Now he has raised that chronology considerably, placing most of the MB II period before 2000 BC.¹⁸⁷ As seen by the Project ArAGATS collaborators, "[c]omparison of radiocarbon determinations from the Trialeti-Vanadzor complexes . . . suggest that the Middle Bronze II phase spanned the period from the twenty-second to eighteenth centuries B.C."¹⁸⁸ Even more radically, Viktor Trifonov would put all phases of the Trialeti culture before 2000 BC.¹⁸⁹

Yet another tin bronze rapier in southern Caucasia has recently been reported and this one may be still earlier than the seven described by Abramishvili. In 2010 Simonyan reported finding at Nerkin Naver a rapier in a grave that he dates to the last quarter of the third millennium BC. It is also reported that isotopic analysis shows that the rapier's copper came from mines near Alaverdi, in the Lori province along Armenia's border with Georgia.¹⁹⁰

In the lands south of the Caucasus the owners of rapiers were not kings, but neither were they commoners. According to Abramishvili, the seven rapiers he published came "exclusively from medium-size kurgan graves that apparently belonged to a certain level of the elite; contrarily the ordinary 'soldiers,' as shown on the Karashamb goblet, were equipped with daggers, spears and shields."¹⁹¹ For whatever else they were intended, the rapiers were obviously meant for display: during their lifetime the men buried in the Talysh and Trialeti kurgans were proud to go about girded with a long bronze rapier. In a kurgan in the Mravaltskali valley the excavators found bits of gold at the tang of the rapier, indicating that the organic hilt had been sheathed with gold leaf.¹⁹² Although serving to display the owner's status, the rapiers may not have been entirely dress or ceremonial pieces. Several of the blades are nicked on the blade or bent at the tip, and at least three of the tangs are broken, suggesting that the rapiers had been damaged either in combat or in swordplay.

Although absolute dates for the south Caucasian rapiers are a matter for specialists to debate and decide, as more carbon dates for associated organic material become available, to a generalist it is becoming clear enough that the south Caucasian rapiers predate those from the Aegean. The argument from typology also

makes the south Caucasian rapiers earlier than those from the Aegean and Byblos. With their very rudimentary (single rivet) hilt, the south Caucasian rapiers are more likely to represent the beginning of a tradition than to be a regression from the multi-riveted rapiers found in the Aegean.¹⁹³ In short, it appears that in the lands south of the Caucasus, very early in the second millennium BC and perhaps already late in the third, men worthy of being buried each in his own kurgan were accustomed to carrying a rapier. That these men had used the sword in combat is not demonstrable, but enough specimens have been found for us to see that in southern Caucasia the rapier was not a ritual object or an extravagant curiosity reserved for royalty but a standard badge of distinction for men in the upper tier of a ranked society. Above I have suggested that some of these men may have begun employment as charioteers by the rulers of Crete late in the MM II period, which is to say shortly before 1700 BC, and that it was from south Caucasians that Cretan royalty adopted the rapier (and then improved upon it) as a symbol of power.

Although the history of the Type A rapier began in southern Caucasia, it was not there that the further development of the sword took place.¹⁹⁴ That happened instead on the Greek mainland and in the Carpathian basin, places where swords had previously been altogether absent. Chapters 5 and 6 will trace the rapid evolution of the sword from the Type A rapier to the much more serviceable Type B sword in Mycenaean Greece, and to the formidable Boiu rapier and the short Apa sword of the Carpathian basin.

Summary

In the first half of the eighteenth century BC, if that is when Hammurabi ruled Babylon, wars were frequent in Mesopotamia. A war here was usually for conquest: a Great King had ambitions to add yet another city to his network of vassals. The war would begin and end with the aggressor's siege of the target city, an operation requiring thousands of laborers as well as a much smaller number of archers, slingers and hand-to-hand warriors. When kings went to war in the Iron Age they normally first met in battle, and the loser would retire to his city to await a siege by the victor, but early in the second millennium BC that was not the case. When Hammurabi or one of his contemporaries went to war his ÉRIN.MEŠ (not yet an army in the usual sense of an armed force) proceeded directly to the alien city in order to lay siege to it.

While the siege was a common occurrence, pitched battles between two armies had apparently not yet begun. The only battles in open country attested in our sources for Mesopotamia, Egypt and the Levant are an ambush of an ÉRIN.MEŠ or a *mêlée* when a king's force of spearmen and archers (usually recruited from nomadic tribes) went out on campaign to attack other nomads who were causing trouble. In an ambush or a skirmish most of the fighting was probably at long range.

Weapons in the eighteenth century BC were not as efficient as they were soon to become. In the Near East the long-range weapons were the sling-stone and the bow (usually a self bow) and arrow. For hand-to-hand fighting, which occurred

infrequently, the thrusting spear had largely although not entirely replaced the axe. The socketed spear was standard in the Near East, in southern Caucasia, and along the southern Urals. First in southern Caucasia and then on Crete an ornate Type A rapier was a sign of status, but that these swords were practical weapons is unlikely.

The evidence suggests that by the middle of the eighteenth century BC some form of chariot warfare was waged in the steppe, in central Anatolia, and probably in the highlands south of the Caucasus. Occasionally sieges may have been laid in the steppe, where several dozen small towns or large villages were enclosed by modest fortifications. The variety and quantity of weapons found in graves both in the steppe and in southern Caucasia suggest that in those places combat was not unfamiliar. That the rulers of Middle Minoan Crete went to war is not likely, although they indulged in some kind of military display and certainly had the means with which to intimidate Aegean islands and the coasts of the Greek and Anatolian mainlands. On the Greek mainland and in temperate Europe we have no evidence for warfare at so early a date (homicides and massacres are another matter). An indication that battles were not yet fought in Greece and in temperate Europe is the absence of meaningful fortifications and of spearheads. The material record in the Indus valley includes few if any weapons and no portrayal of combat.

Altogether, warfare ca. 1750 BC seems to have been geographically limited. In most of the Near East wars were frequent but they were very different from what they would be in later antiquity. The following chapter will show that by ca. 1750 BC at least one king in Anatolia—Anitta of Kanesh—seems to have employed a small unit of military chariots. In Mesopotamia, the Levant and Egypt this was not yet the case: Hammurabi and the other Great Kings of his generation had not yet experienced the clash of two armies on a battlefield, which was soon to become the centerpiece of warfare. A heightened militarism seems to have appeared first in the horse country of the steppe and southern Caucasia, and it is probable—although not demonstrable—that early in the second millennium BC a new form of warfare had begun there, in which chariot-borne archers played the central role.

Notes

- 1 Luttwak, "The Best and the Fastest," *The New Republic* vol. 240, issue 16 (Sept. 9, 2009), pp. 45–47.
- 2 Turney-High 1949.
- 3 Keeley 1996.
- 4 See now Ferguson 2014. At pp. 210–219 Ferguson argues that skeletal remains indicate that from the Natufians to ca. 3000 BC warfare was either rare or completely absent in the southern Levant. In the Jezirah he identifies the Halafians in the 6th millennium BC as "the first cultural group to expand via war."
- 5 Carman 2013, p. 25.
- 6 Yadin 1963, pp. 36 and 39.
- 7 Yadin 1963, p. 35.
- 8 See, for example, Bradford 2001, p. 4:

Phalanx tried to break phalanx by shoving, jabbing with the spear, and hacking with the axe. The ensi's also employed carts pulled by four onagers (wild

donkeys). Each cart had a shield in front, a driver, and a warrior armed with spears. The carts may have shaken the opposing phalanx by their noise and appearance, or by the threat of outflanking the enemy, or they may have been used to ride down those who fled.

Carey 2013, p. 13, also makes the “chariot” essential in Sumerian battles:

Perhaps no other single military invention is as associated with the ancient period as the war chariot. The military application of the wheel came quite early in the development of civilization, with the first chariot integrated into Sumerian battle tactics around 3000 BCE.

9 Dawson 2001, pp. 16–17.

10 Schulman 1963.

11 Stillman and Tallis 1984, p. 56.

12 For an egregious example see Drews 1988, p. 89:

In the early days of chariotry the number of chariots was apparently quite small, as infantry continued to be the king’s principal arm. In such circumstances, chariots were assigned to harry the flanks and the rear of an infantry and then, once a formation had been broken up, to pursue and kill the individual infantrymen.

13 Drews 1993a.

14 As one of many examples, Egyptologist Ulrich Hofmann (Hofmann 2004, p. 151) assumes that in the New Kingdom the pharaoh employed chariots to protect his formation of offensive infantry: “In order to counter enemy chariots attacking the flanks or the rear of one’s own infantry, one had to have a chariotry similarly deployed and of similar size” (“Um einer gegnerischen Bewegung auf die Flanken und hinter den Rücken der eigenen Infanterie zu begegnen, bedurfte es einer gleich gearteten Waffenkombination (Pferd und Wagen) in angemessener Anzahl”). For a detailed defense of the traditional understanding of Late Helladic warfare as infantry warfare see Dickinson 1999a.

15 Littauer and Crouwel 1996b, p. 300.

16 Gimbutas 1997a, p. 357.

17 Abrahams and Battini 2008.

18 Cooper 1986, Insc. La 3.1, ix (p. 34). For other interpretations see Cooper’s notes on this text.

19 Parrot 1971, p. 255 reported that the 1971 excavations confirmed “que dans les couches profondes, deux palais, tous deux présargoniques, furent superposés.”

20 Yadin 1972. Parrot 1971, p. 269, briefly discussed this “relief en pierre blanche avec ornamentation incise (pl. XIV, 4).” He believed that it showed an “infanterie” that had the foresight to provide itself with good weapons and good protection defeating enemies who had neither.

21 Yadin 1972, p. 92:

The first thing that strikes one’s eyes is the use of the tall, top-curved Neo-Assyrian shield (a remarkable phenomenon in itself, since its appearance in the Mari slab precedes hitherto known appearances of this type by about eighteen centuries); one should bear in mind that this shield was always used by the Assyrian armies in siege warfare. It served to protect archers near the wall, in exactly the same position as that depicted on the slab.

22 Kramer 1963, p. 74. For recent examples see above, note 8.

23 Lafont 2009, §6.5, doubting the use of such a vehicle in Sumerian warfare remarks on “its virtual absence in our archival texts.” See Abrahams 2008, p. 12, on the absence of the “char” in Akkadian armies: “Contrairement à la période présargonique, les

données sur l'utilisation militaire du char sont absentes de la documentation visuelle et ne sont pas non plus explicites pour ce qui est des textes."

- 24 Littauer and Crouwel 1979, p. 30.
- 25 Littauer and Crouwel 1979, p. 33. Although experiments with a pivoting or swiveling front axle may have been done from time to time during the Bronze Age, the innovation was not perfected until the middle of the 1st millennium BC. See Piggott 1983, pp. 156–158 ("The problem of the pivoted front axle").
- 26 Dawson 2001, pp. 84–85, having concluded that "[i]t is impossible to imagine this contraption being used in battle."
- 27 According to Abrahams 2008, p. 1, the Cuneiform Digital Library Initiative includes 8077 Old Akkadian tablets. These come especially from archives at Girsu, Umma, Adab and Nippur.
- 28 At Abrahams 2008, pp. 13–14, discussion of "l'ordre de marche" is drawn almost entirely from the disposition of soldiers on Naram-Sin's victory stela.
- 29 Line 20 of Rimush C 6, at Gelb and Kienast 1990, p. 206. Here the Sumerogram GURUŠ.GURUŠ (see also line 9 of Rimush C 3, at Gelb and Kienast 1990, p. 199) indicates that the men Rimush claimed to have slain in battles were "young men" or conscripts.
- 30 See the tabulation at Hamblin 2006, p. 79.
- 31 In Gelb and Kienast 1990 this is *in sc.* Sargon C 2. Gelb and Kienast translate the line as "5400 Mann essen täglich vor ihm Brot." This has usually (although not always) been interpreted to mean that he employed 5400 warriors.
- 32 Foster 2016, p. 95:

Given Sargon's statement that he fed 5400 men per day (Appendix Ib 7), one may suggest that the main thrust of Akkadian recruitment efforts was for the military. Sargon and his successors sought dependent labor for their armies rather than for fieldwork, thereby raising a military force that no other rulers of the time could match or withstand.

See also Postgate 1992, p. 41.

- 33 For such a reconstruction of Akkadian battles see Hamblin 2006, pp. 76–78.
- 34 Burke 2008, p. 28.
- 35 Lafont published his findings in "L'armée des rois d'Ur: ce qu'en disent les textes," which appears on pp. 23–48 in Abrahams and Battini 2008. A year later Lafont's article was translated into English and is now available online as "The Army of the Kings of Ur: the Textual Evidence," *Cuneiform Digital Library Journal* 2009:5. For the online version (henceforth, Lafont 2009) see http://cdli.ucla.edu/pubs/cdlj/2009/cdlj2009_005.html (accessed January 19, 2007).
- 36 Lafont 2009, §1.6.
- 37 Lafont 2009, §2.6.
- 38 Lafont 2009, §4.1.
- 39 Burke 2008, p. 28: "It is particularly noteworthy that in none of the year-names that commemorate military engagements is there a commemoration of a single pitched battle."
- 40 Heimpel 2003.
- 41 Glock 1968; Sasson 1969.
- 42 Sasson 1969, pp. 43–45.
- 43 Glock 1968, p. 171.
- 44 Dalley 1984, p. 146.
- 45 Burke 2008, p. 27. See also the more cautious appraisal at Hamblin 2006, p. 207, in his single-page discussion of "Battle" in the Age of Hammurabi:

Generally speaking, when facing a stronger enemy, an army would withdraw to a fortified city or camp rather than engage in open battle. When battles are

described, they are sometimes an attempt to drive off a besieging army. In this sense it may be that Middle Bronze warfare in Mesopotamia was broadly parallel to late medieval warfare in western Europe, where raids, sieges, and attempts to rescue besieged cities were more frequent than efforts to defeat an enemy field army in open battle.

- 46 On the Egyptian evidence see Schulman 1982.
- 47 See Lacambre 1997.
- 48 In Heimpel 2003, the translation of Letter 27 141 appears at pp. 457–458.
- 49 Letter 27 142, at Heimpel 2003, p. 459.
- 50 Letter 27 147, at Heimpel 2003, p. 460.
- 51 For translation of the formula and discussion of the events see Sasson 1998, p. 461. Sasson believes that Zimri-Lim had died a natural death shortly before Hammurabi's expedition.
- 52 On the recruitment of 5000 Hana fighters see Hamblin 2006, p. 194. Heimpel 2003, pp. 30–36, provides an excellent study of the Hana encampments, as well as an analysis of the term or name *ha-na* or *ha-nu-ú*.
- 53 Heimpel 2003, p. 29.
- 54 See Ziegler 2008, p. 50: "L'idée de Samsí-Addu est simple: les gens pauvres lui seront dévoués grâce aux avantages matériels qu'il leur procure."
- 55 Hamblin 2006, pp. 428–429, presents what little is known about the training of conscripts in OK and MK Egypt, and notes that considerable training in archery is attested only in NK sources.
- 56 In the Mari tablets the spear is the most frequently mentioned weapon. See Hamblin 2006, p. 252.
- 57 Suzanne Richard (Richard 2006, p. 126) observes that "the general consensus among scholars is that socketed (bronze) spearheads define the Middle Bronze urban era. . . ." but she argues that two or possibly three socketed spearheads found in the Levant date as early as the EB IV period.
- 58 On the sickle-axe and sickle-sword see Hamblin 2006, pp. 66–71. On the sickle-sword Hamblin observes (p. 71) that "[a]s with the Akkadian rectangular sickle-axe and the Babylonian curved sickle-axe, the sharp blade of the weapon occupies only the upper third, betraying its origin from the axe-head."
- 59 Hamblin 2006, pp. 221–236, provides a detailed description of sieges in the Old Babylonian period.
- 60 Kern 1999, p. 12; Burke 2008, p. 60.
- 61 Burke 2008, p. 48, notes that the terms "rampart" and "glacis" are often used interchangeably, but he restricts the term "glacis" for the outer facing of the rampart.
- 62 Burke 2008, pp. 56–59.
- 63 Burke 2008, p. 147 with Table 22, and p. 152 with Table 23.
- 64 Burke 2008, p. 144 with Table 20.
- 65 With reference to the composite bow that Naram-Sin appears to be holding on his victory stele, Yadin 1963 proposed that the composite bow came into use in the armies of Sargon and Naram-Sin in the Akkadian period. Yadin 1972, on the newly discovered Mari slab, raised the date to the Early Dynastic period. Hamblin 2006, pp. 89–95, concluded that in the Near East the composite bow did not become a significant weapon until the 17th century BC. Although that is probably correct, I believe that as a status weapon for kings and princes the composite bow had been around since the beginning of the 3rd millennium BC. Collon 2008 shows five probable representations – three of them on cylinder seals – of a composite bow from 3rd-millennium Mesopotamia. For what certainly looks like the representation of a composite bow on a stone slab at an Early Bronze Age tomb at Novosvobodnaya, north of the Caucasus, see Shishlina 1997, p. 56 and Fig. 3.

- 66 According to McLeod 1965, p. 14, experiments showed that “the best ranges attained by wooden self bows were 170–210 yards (155–190 meters).”
- 67 Kern 1999, p. 18.
- 68 Lafont 2009, p. 5.
- 69 For texts vividly illustrating desperation of the besieged see Hamblin 2006, pp. 234–235.
- 70 Even in the Late Bronze Age ÉRIN.MEŠ occasionally denotes a labor force. See p. 159 in Harry Hoffner’s *Letters from the Hittite Kingdom* (Atlanta: Society of Biblical Literature, 2009 [edited by Gary Beckman]). Letter 39 of the corpus reports that in various places an ÉRIN.MEŠ is engaged in the harvesting of grasses. Observing that the translation of the term as *Soldaten* is inappropriate in this context, Hoffner here translates ÉRIN.MEŠ as “work-gangs.”
- 71 Although we cannot take at face value what the sources say about how many men Shamshi-Adad I took with him on campaigns, Nele Ziegler concludes that it was “plusieurs dizaines de milliers d’hommes” (Ziegler 2008, p. 51).
- 72 Branigan 1974, nos. 1–422.
- 73 See now Kletter and Levi 2016. Reporting on the ubiquity of bronze daggers in several MB II cemeteries at Rishon Le-Zion, south of Tel Aviv, the authors challenge the traditional labeling of male burials with daggers as “warrior graves.” The dagger seems to have been a standard accoutrement for adult men in the southern Levant.
- 74 Branigan 1974, nos. 423, 424, 429, 430, and 431. The only socketed spearhead in Branigan’s catalogue is no. 472, from Malthi, which was dated MH by the excavators but would now be placed in the LH period.
- 75 Marinatos 2005.
- 76 On this site see Broodbank and Kiriati 2007. At p. 268 the authors comment on the intensive “Minoanization” in the MB period: “As far as can be assessed, the indigenous pottery tradition had more or less vanished by the First Palace period (beginning ca. 1950 B.C.E.), and henceforth, Kytheran site assemblages are exclusively based on Cretan models for some 500 years.”
- 77 Fig. 13 and 14b in Rutter 2001.
- 78 Manning 1986, p. 286.
- 79 See Manning 1986, p. 286:

At the closest and most Minoanised sites of Kastri on Kythera, Akrotiri on Thera, and Trianda on Rhodes, there were no fortifications. In this respect they resemble contemporary sites on Crete. However, the more distant sites, like Ayia Irini on Keos, and Kolonna on Aegina, remained fortified during this period.

No MH fortifications on the mainland have been found. The fortified village at Malthi seems to date to the LH III rather than the MH period assigned to it by Natan Valmin. See Dickinson 1994, pp. 59–60.

- 80 See Dickinson 1994, p. 98, and Watrous 2001, pp. 173–176, on Cretan metalwork in the MM I and II periods. Watrous brings down to MM some of the metalwork that Keith Branigan had assigned to the EM period.
- 81 See Gale and Stos-Gale 1982, p. 18:

Several lines of evidence suggest that the Laurion was one of a number of important sources of copper to the Bronze Age Aegean, including our lead isotope analyses. Our finding that Laurion copper was important for Crete harmonizes with our earlier finding that the Laurion was an important source of lead for Crete in the Bronze Age.

- 82 Davis 1986.
- 83 Abramovitz 1980.
- 84 On MM II Kolonna see Niemeier 1995 and Gauss 2010, pp. 744–746.

- 85 Schofield 2007, p. 30.
- 86 Manning 1986, p. 286; Gauss 2010, p. 745.
- 87 The rhyton portrays a battle taking place between a fortified place and the sea. The wall includes towers, and women are standing and gesturing on the wall, but there is no siege tower, siege mound, or siege operations. As interpreted by Hooker 1967, the rhyton portrays not a siege but rather the landing of aggressors and the attempt by archers to dispel them during the Shaft Grave era. In the scene as interpreted by Marinatos, "a town is under siege and a naval force arrives by sea, perhaps to aid the town" (Marinatos 2005, p. 153).
- 88 See Kilian-Dirlmeier 1993, no. 16, and her commentary at pp. 15–16 on the dating of this sword. A slimmer Griffplattenschwert (Kilian-Dirlmeier no. 6) comes from Jonkovo, Bulgaria, but its find circumstances are unknown. Several long blades from Arkalochori are also catalogued as Griffplattenschwerter by Kilian-Dirlmeier, although they have no rivet holes in the potential grip plate and were therefore not swords but sword-blades. See Kilian-Dirlmeier nos. 12–15
- 89 For the Type A Mallia swords see Kilian-Dirlmeier 1993, nos. 32 and 33. The part of the palace in which they were found probably, although not certainly, collapsed with the rest of the palace at the end of MM II.
- 90 Kilian-Dirlmeier 1993, no. 39.
- 91 For four incised and well-preserved Type A rapiers from Arkalochori see Kilian-Dirlmeier 1993, nos. 22–25 (nos. 26–30 are catalogued but not shown). See also Sandars 1961, p. 17, with Plate 17,3.
- 92 J. S. Pendlebury dated the Arkalochori rapiers to the MM III period, mostly on typological grounds, and that date is still accepted. Molloy 2010, p. 404, also assigns the Arkalochori swords to MM III. The MM III palace at Galatas was discovered in 1992.
- 93 The treasure does not seem to have been votive. Ellen Adams observes that the normal signs of ritual—figurines, offerings, an altar—have not been found at the cave, and she concludes that "[T]he deposit resembles a hoard deposited on a single occasion, rather than the remains of repeated ritual practice." See Adams 2004, pp. 33–34.
- 94 See Molloy 2010, p. 404, note 11: "[T]he fragmentary state of many pieces is the foremost problem in ascertaining exact quantities."
- 95 For the Amorgos swords see nos. 489, 490 and 491 (on Plate 11) in Branigan 1974. At p. 165 Branigan gives the three no chronological context. See also Sandars 1961, Plate 17, no. 7.
- 96 Renfrew 1967, p. 13, noting that tin bronze was very rare in EB Aegean, concluded that the tin bronze sickle from Amorgos dates to the LBA. "The three swords from Amorgos (Cat. nos. 70–72) are likewise later than the Early Bronze Age." For a less skeptical view see Branigan 1968, p. 198, and Dickinson 1994, p. 200.
- 97 Molloy 2010, p. 404.
- 98 See Branigan 1968, p. 198:

A study of the individual features of the Byblos sword therefore leads one to the conclusion that this weapon would be much more at home in the Aegean, and this is surely confirmed by the absence of suitable descendants of the sword in Syria in the period of the Middle Bronze Age.

- 99 Kilian-Dirlmeier 1993, p. 48: the Type A rapier had "eine rein ägäische Entstehung."
- 100 See Dickinson 1994, p. 50: "it has been calculated that, according to the number of zones of plates, anything from thirty to seventy-five pairs of tusks would be needed for a single helmet."
- 101 Goldman, *Excavations at Eutresis in Boeotia* (Cambridge, Mass.: Harvard University Press, 1931), p. 54; see also p. 220 and Fig. 290. The tusk plates were found on the

floor of House E in the MH II level. See also Borchhardt 1972, pp. 19 and 32 (labeled 4 V in Borchhardt's Katalog).

- 102 On the dating of the Eleusis grave see Papadimitriou 2010, pp. 248 and 250. On its characterization see Cosmopoulos 2015, p. 76, surveying the burial evidence for all of MH Eleusis:

Burial gifts are usually sparse, a phenomenon paralleled in other MH burial sites; they consist of sherds from open fine Grey Minyan vases (presumably bowls and cups) and coarser (probably storage) vessels. On occasion a grave may contain one or two obsidian pieces or a few animal bones. The only grave that seems to have been wealthier is the so-called "Warrior Grave", in which were found a blade from a bronze dagger, a small dark burnished jug, a bone band decorated with concentric circles, and fifty-one small fragments of worked boars' tusks in a triple row, that probably would have belonged to a pendant.

- 103 In 1930 the excavation of a Neolithic cemetery near Mariupol, on the Sea of Azov, brought to light many sawn and perforated plates of boars' tusks. Some of them had been sewn onto shirts and some were along the thighs. Others lay near the skulls of the interred and were therefore interpreted as the residue of helmets. See Excurs I, "Die Eberzahnplatten vom Asowschen Meer," pp. 28–29, in Borchhardt 1972. On the likelihood that boar's-tusk helmets originated on the Pontic steppe see Borchhardt's remarks on p. 26:

Die neolithischen Eberzahnplatten aus Mariupol (Exkurs I) legen den Schluss nahe dass die Sitte, Kopfbedeckungen durch aneinander gereihete Eberzahnplatten zu schmücken und zu verstärken, unter den Jägerkulturen am Schwarzen Meer verbreitet gewesen ist und vielleicht bei den Einwanderung eurasischer Streitwagenvölker in gewandelter Form ihren Weg nach Griechenland gefunden hat.

See also Kristiansen and Larsson 2005, p. 247. Although Gimbutas dated the Mariupol graves to the late 3rd millennium BC, calibrated carbon dates have put them much earlier: in the 6th millennium BC. See Kotova 2010, p. 167. On the graves see Anthony 2007, pp. 174–182. At p. 181 Anthony reports that 429 boar's-tusk plates were found at Mariupol, and were distributed over 10 percent of the graves. Because it is not likely that helmets were in use in the 6th millennium BC, the boar's-tusk plates on headgear in the Mariupol cemetery, like those sewn on shirts or tunics, may have been more decorative than protective. Cf. Borchhardt 1972, p. 28: "Die Fundlage erweist sie als Schmuckbesatz der Bekleidung." Borchhardt also reports, however, that in Grab VI at Mariupol were two complete tusks, with the sharp ends forward, near the skull of a man's skeleton.

- 104 Branigan 1974, nos. 1–422. Several of these come from the Argolid (Berbati, Lerna, Prosymna), which—thanks to its excellent harbor—was readily accessible from Crete.
- 105 Branigan 1974, nos. 423–472A. Of these, no. 425 is from EH II Lerna and no. 436 from MH Sesklo. See also no. 438 from Dramesi, near Thebes, but this shoed spearhead evidently was looted from the tholos at Dramesi and must date from late in the MH or early in the LH period. More important is no. 435, a mold from MH Sesklo. Many of the EB and MB spearheads catalogued by Branigan come from the Cyclades (especially Amorgos) and from Troy.
- 106 In Avila 1983 no. 2 is from Dramesi and no. 4 from Sesklo. The Sesklo mold is no. 5. For the Sesklo spearhead Avila suggests *Zeitstellung*: MH II/III?, and for the mold *Zeitstellung* MH? (the question marks are Avila's).
- 107 These shoed spearheads have been studied by Claus Reinholdt (see Reinholdt 1993). The shoed spearhead was cast with an open "shoe" on either side of the blade, so

that the blade was fixed to the wooden shaft not only by a tang that went four or five cm deep into the shaft (and was usually fastened with a single rivet), but also—above the tang—by a pair of “shoes,” each of which enclosed a lunate of the shaft. Although more secure than the simple tanged spearhead, the shoed spearhead was inferior to the socketed spearhead, by which it was superseded (all except one of the spearheads deposited in the Shaft Graves at Mycenae were socketed).

- 108 In Avila 1983 the shoed spearheads, Avila’s Typ I, are nos. 1–7b. No. 1 comes from Shaft Grave IV at Mycenae, no. 2 from Drameši, near Thebes, no. 3 from Steno on the island of Lefkas, nos. 4 and 5 from Sesklo, 6 and 7a from Vajzë in Albania, and 7b from Asine.
- 109 Buck 1966, pp. 195–196.
- 110 See Philippa-Touchais et al. 2010.
- 111 Kayafa 2010, p. 703. I assume that the sword Kayafa has in mind is the rapier from the warrior grave at Thebes, dated by some to the MH II period.
- 112 Catling, in *AR 33 (AR for 1986–1987)*, p. 24, said only “A MH date is suggested.” Schofield 2007, p. 30, puts the burial in the pre-Mycenaean period. This warrior grave was published by Maria Kasimi-Soutou, “Μεσσοελλαδικός τάφος πολεμιστή απο τη Θήβη,” *Archaiologikon Deltion* 35A (1980) [1986], pp. 88–101.
- 113 According to Kasimi-Soutou 1986, p. 100, the grave goods and the burial “χρονολογούνται στη μεταβατική φάση της ME III προς YE I.”
- 114 Driessen 1990, p. 125, dated the Theban tomb, along with several others, “to the very end of the Middle Bronze Age,” with an explanation in fn. 441: “Dr. K. Demakopoulou kindly informed me that these burials should all be dated to the Shaftgrave Period. . . .” Kilian-Dirlmeier 1993 dated the Theban sword (no. 31) to MM III/LH I.
- 115 For the spearhead see Kasimi-Soutou 1986, Fig. 4.
- 116 In the catalogue in Avila 1983 the shoed spearhead from Shaft Grave IV is no. 1. On the significance for dating see also Branigan 1974, p. 18.
- 117 For a full review of the osteological evidence for massacres in Neolithic Europe see Beyneix 2001 and Guilaine and Zammit 2005.
- 118 Guilaine and Zammit 2005, p. 135, report sixty-three arrowheads embedded in skeletons from the Neolithic period in France and remind the reader that many more deaths would have resulted from injuries to the soft tissues.
- 119 Mercer 1999, p. 150.
- 120 Guilaine and Zammit 2005, p. 127.
- 121 See Haak et al. 2008.
- 122 See Figs. 45 and 46 in Guilaine and Zammit 2005 for flint knives from the Corded Ware culture.
- 123 Gimbutas 1970, p. 184.
- 124 See Beckerman 2015. At p. 25, under the heading “Martiality,” Beckerman writes, “Ever since Childe, martiality has been seen as an important aspect of Corded Ware Culture society,” but she finds little evidence to support that characterization: “Examples of the use of violence are, however, rare.”
- 125 These dates for Bz A1 and Bz A2 follow the chronology for central Europe given by Benjamin Roberts, Marion Uckelmann and Dirk Brandherm in Fig. 2.1, on pp. 18–19, of Fokkens and Harding 2013.
- 126 In their *Bronze Age Warfare* Richard Osgood and Sarah Monks concluded “that warfare was a widespread and lethal phenomenon experienced by peoples of the Bronze Age throughout Europe” (Osgood and Monks 2000, p. 138). Although that statement may be true, it seems to rest primarily on evidence from the Middle and Late Bronze periods, roughly from the middle of the 2nd to the early 1st millennium BC.
- 127 A. F. Harding, *Warriors and Weapons in Bronze Age Europe* (Budapest: Archaeolingua, 2007).

- 128 Harding 2000, p. 285, in discussing the earliest evidence for shields, cites a burial in Bush Barrow near Stonehenge (fragments of wood along with bronze rivets). Needham, Lawson and Woodward 2010, p. 10, find unconvincing the suggestion that the rivets and fragments are the remains of a shield. Harding also mentions a shield mold at Kilmahamogue in Northern Ireland, carbon dated 3445 ±70 BP, so 15th century BC.
- 129 See Harding 2000, p. 284; “Such arrowheads were tanged and made of stone—typically flint—in the Early Bronze Age, but by the Middle Bronze Age were socketed and made of bronze.”
- 130 Harding 2007, pp. 55–70.
- 131 Thorpe 2013, p. 235.
- 132 See Kletter and Levi 2016.
- 133 Harding 2000, p. 281. Harding goes on to estimate—correctly, I think—the significance of the spear: “Pre-eminently a thrusting weapon, the spear must have superseded the dagger as a means of inflicting damage on an opponent without getting too close, and therefore represents a dramatic new development in fighting techniques.”
- 134 Harding 2000, p. 275.
- 135 Harding 2000, p. 292. Sherratt 1994, p. 268, summarizes the beginning of effective fortifications, visible especially in Romania and Slovakia, that occurred in the middle of Bz A2.
- 136 On these see Toms 2000, pp. 92–93.
- 137 Possehl 1997, p. 434.
- 138 Cork 2005 identifies some of the blades found at Harappan sites as daggers, and argues that the many Harappan bronze axes—even though unsocketed—could have been used in battle.
- 139 According to Possehl 1997, pp. 434–435, no demonstrable fortifications have been found at Mature Harappan sites, and the two “citadels” were probably places for ritual.
- 140 Although Possehl 1997 proposes that what the Indus valley civilization experienced ca. 1900 BC was a “transformation” rather than a decline or eclipse, the transformation seems no less bleak than an eclipse. Possehl proposes that many inhabitants of Sindh and Baluchistan moved either to the east or to Gujarat, where considerable continuity from Mature to Late Harappan is evident. The most likely factor in the abandonment of cities in Sindh and Baluchistan, Possehl suggests, was a sudden dropping of the Indus, and so a decrease of the irrigation waters on which agriculture depended. A tectonic shift in the Himalayas may have sent much of the mountain water east to the Ganges rather than west to the Indus.
- 141 It is pertinent here to cite Sarva-Daman Singh, *Ancient Indian Warfare, with Special Reference to the Vedic Period* (1965). After dispensing with pre-Vedic India in a single paragraph, Singh went on to Vedic literature. At pp. 7–8 he proposed that,

mighty citadels such as those of Harappā and Mohenjodaro, provided with watchmen’s quarters, suggest the presence of standing garrisons to man the defences. Fighting, then, must already have become a profession, and the army, such as it was, an important factor in the life of these wealthy communities. The Rgvedic references to the forts and large armies of the native inhabitants of India lend support to the evidence of archaeology.
- 142 On this culture see Anthony 2007, pp. 382–385.
- 143 Koryakova and Epimakhov 2014, p. 63.
- 144 Anthony 2007, p. 385.
- 145 Anthony et al. 2005, p. 398, report that the structure, evident from many post-holes, measured approximately 14x8 m.

- 146 Anthony et al. 2005, p. 412, calculate that at least eighteen dogs were butchered.

The dog bones show skinning and dismemberment marks, and were broken (for marrow?) like those of cattle and sheep. Dog heads, which are over-represented compared to other body parts, were roasted and then carefully chopped into 10–12 small, neat, almost identical segments with axe blows.

The winter season of the animals' death was determined by measurement of the dental cementum.

- 147 Anthony et al. 2005, p. 413.
 148 See Bersenev, Epimakhov and Zdanovich 2011, Fig. 2.
 149 Kohl 2007, p. 153.
 150 Bersenev, Epimakhov and Zdanovich 2011, p. 197.
 151 See Kohl 2007, p. 146: "Two hundred or more settlements of the KMK have been documented, some of them with cultural deposits approximately 1 m. thick."
 152 Parzinger 2013, p. 910.
 153 See Anthony 2005, p. 396:

At the beginning of the LBA, about 1900–1800 BC, the people of the Samara Oblast began to live in a new way. At the same sites where they stayed only briefly in tents or wagons (?) in the MBA, permanent timber buildings were erected and thick middens of garbage were deposited in the LBA. Settlement sites became archaeologically visible as if a veil had been lifted across the northern steppe and forest-steppe. About 150 Srubnaya settlements and 60 Srubnaya kurgan cemeteries are known in the Oblast, where there were only 10 very small scatters of MBA ceramics to represent MBA settlement. . . .

- 154 Kushnareva 1997, p. 207. Kushnareva here describes the settlements surrounded by moats as "reminiscent of the *terramara* dwellings of northern Italy."
 155 Smith 2009, pp. 27–28.
 156 Kushnareva 1997, p. 208: "The latter [defensive systems] are evident at Kyul-Tepe II, Karmir-Berd, Uzerlik-Tepe, Garakapek-Tepesi, Shaglama I, and Shaglama II."
 157 Kohl 2007, p. 120: "It is thought, though not yet conclusively demonstrated, that the earliest fortresses with cyclopean stone architecture . . . may first date in the Middle Bronze period." Contra, see Shanshashvili and Narimanishvili 2013, p. 179: "The construction of 'cyclopean' settlements and fortresses in the central regions of the Southern Caucasus started from 16th century BC."
 158 Kushnareva 1997, pp. 90–93; for illustrations of some of the weapons see her Fig. 39 (p. 98).
 159 For the goblet see Kohl 2007, Fig. 3.28, or Kushnareva 1997, pp. 112–113, with Fig. 48. Kushnareva concludes that both the silver goblet from Karashamb and the gold cup from Kirovakan were of local origin and workmanship.
 160 Edens 1995, p. 60.
 161 Kohl 2007, p. 116.
 162 Smith 2009, p. 28. On the same page Smith suggests that,

[t]he appearance of carts and wagons, as well as ox and horse sacrifices, in burials from sites such as Trialeti (group II, Djaparidze 1969; Gogadze 1972), Lori-Berd (Devejian 1981), Aruch (Areshian et al. 1977), and Kirgi (Esaian 1976:101) attest not only to the technology of mobility during the Middle Bronze Age, but also its centrality to dimensions of belief and value. Similarly, the inclusion of large numbers of bronze spearheads, axes, swords, daggers and arrowheads (also of obsidian) point to the considerable violence of the era.

- 163 Pogrebova 2003, following Littauer and Crouwel, and writing when the Lchashen chariots were the earliest known from the region, argued that the southern Cau-

casian chariot originated in Syria and Mesopotamia, that it did not arrive in southern Caucasia until ca. 1400 BC, and that chariot warfare—far from beginning in southern Caucasia—was negligible there.

- 164 On which see Piggott 1983, pp. 66–78.
- 165 Bendukidze 2010, p. 267. For the dating of the lower stratum at Jinisi see Narimanishvili and Amiranishvili 2010, p. 232.
- 166 On the “large quantities” of horse bones from Early and Middle Bronze contexts in Armenia see Manaseryan and Mirzoyan 2013, pp. 136–137. Simonyan and Manaseryan 2013 detail the evidence for horse sacrifices in the “royal” kurgans in the period 2250–1750 BC.
- 167 Simonyan and Manaseryan 2013, p. 187, with Fig. 12. I do not see a nave in the “wheel” that is visible in Fig. 12.
- 168 Personal correspondence, August 28, 2015, from Hakob Simonyan.
- 169 Simonyan and Manaseryan 2013, p. 187 with Fig. 13; on the dating of N1 see their p. 183.
- 170 The chariot burial is described by Simonyan in his “New Discoveries at Verin Naver, Armenia,” pp. 110–113 of *Backdirt: Annual Review of the Cotsen Institute of Archaeology at UCLA* 2012. Other presentations, of varying quality, are available on the Internet.
- 171 Drews 1993a, p. 120.
- 172 Houwink ten Cate 1984, p. 56.
- 173 I discussed the Manda-troops in Drews 1988, pp. 227–229. A thorough analysis of the term, dealing as much with the 2nd millennium BC as with the first, has recently been published by Selim Ferruh Adalı (see Adalı 2011). Adalı leaves no doubt that *umman*, the first word in the compound *umman-manda*, is to be understood as “troops”: in later sources the compound is sometimes written with the Sumerogram ÉRIN-*manda* or ÉRIN.MEŠ-*manda*. The referent of the second word, *manda*, remains elusive but in Old and Middle Babylonian and Assyrian usage the word is a toponym, applied to a land in or near the mountains to the northeast of Mesopotamia. In the 1st millennium BC, under the influence of “The Kuthaeon Legend of Naram-Sin,” the word came to be used indiscriminately as an ethnonym for “barbarians.”
- 174 The earliest by far, anywhere in the world, are nine short swords found at Arslantepe in southeastern Turkey. These nine specimens were made of copper, with a slight alloy of arsenic, and three were inlaid with silver. The ceramic context of the nine swords, along with carbon dating on associated organic material, places them toward the end of the Uruk period, and no later than ca. 3000 BC. On these see Schulz 2005, p. 217 (“Älteste Schwerter in Vorderasien und Ägais”). See also his Abb. 1. These Vollgriffschwerter (with hilt and blade cast as a single piece of metal) measure between 45 and 60 cm. Next earliest of all known swords—some 600 or 700 years later than those from Arslantepe—are those found at Alaca Höyük, in central Anatolia. See Schulz 2005, Abb. 2. See also Sandars 1961, pp. 18–19 and plate 15, nos. 3–5. The Alaca Höyük swords are made of arsenical bronze, and were obviously highly treasured. Along with much gold and other luxury items, including a silver dagger with gold rivets, they were found in the “royal graves” at Alaca and date from the third quarter of the 3rd millennium BC.
- 175 Although Schulz 2005, p. 217, describes the 3rd-millennium BC swords at Arslantepe and at Alaca Höyük he believes that despite these early harbingers the use of swords in battle did not begin until the 18th and 17th centuries BC.
- 176 Déchelette 1910. At p. 429, Fig. 3, Déchelette provided a drawing of one Mycenaean rapier and of the four Lankaran rapiers “dérives de ce prototype.”
- 177 Schaeffer had written his *Stratigraphie comparée et chronologie de l'Asie occidentale (III^e et II^e millénaires)* in Britain during the Second World War and published it there (London: Oxford University Press, 1948). On the rapiers see pp. 418–427, and

Figs. 226 and 227. Schaeffer concluded that the Lankaran rapiers dated ca. 1500–1450 BC, and were degenerate copies of swords from Mycenae.

178 Sandars 1961, p. 19.

179 Bouzek 1985, p. 35.

180 Hiller 1991, pp. 212–213.

181 Kushnareva 1997, p. 110.

182 Abramishvili 2001, updated in Abramishvili 2010. Six of the rapiers, along with the Saduga sword, are shown in Taf. 2, p. 8, in Abramishvili 2001. The seventh rapier, found by Yerevan archaeologists in the excavation of a kurgan near the village of Maisian in Armenia, is reported on pp. 5–6 but not shown.

183 Abramishvili 2010, p. 172. For a more skeptical view of Aegean-Caucasus connections see Levan Tchabashvili 2009. Tchabashvili argues that a connection between the Aegean and the southern Caucasus is not indicated by the obvious similarities between the bronze kettle found in 1938 in Trialeti Kurgan XV and the kettle found in Shaft Grave IV at Mycenae. The similarities can as easily be explained, Tchabashvili believes, on the assumption that both kettles were inspired by an original from a third place, such as northern Mesopotamia or the Levant. Such a *tertium quid*, of course, has not yet been found.

184 Abramishvili 2001, p. 5; for Abramishvili's drawing of the Saduga dirk see his Taf. 2, no. 1.

185 Rubinson 1977; for the earlier dating of MB Transcaucasia see Edens 1995. In personal correspondence (March 21, 2016) Rubinson tells me that in view of the many carbon dates she now would raise the dates in her 1977 publication.

186 Abramishvili 2001, p. 3, acknowledges that “it is difficult . . . to determine termini ante quos both for the first and second phases,” but suggests that MB I in Trialeti may have begun toward the end of the 3rd millennium and that MB II should be placed in the 19th century BC.

187 Abramishvili 2010, p. 172:

Taking into account all of the aforementioned arguments, the richest kurgans of the second phase of the Trialeti Middle Bronze Age Culture, such as Kurgans V, XVII, XXIX and of Karashamb, should fall roughly within the two last centuries of the third millennium BC.

188 Badalyan, Avetisyan and Smith 2009, p. 66.

189 See Trifonov's Abbildung 5, at p. 171 in Fansa and Burmeister 2004.

190 As reported on July 13, 2010, at www.panarmenian.net/eng/details/51219/, accessed January 19, 2017, a website hailing the importance of Armenia in the beginning of civilization. For a brief mention of the Nerkin Naver rapier see Simonyan and Manaseryan 2013, p. 183.

191 Abramishvili 2010, pp. 172–173.

192 Abramishvili 2001, p. 5.

193 See Abramishvili 2001, Taf. 1, for drawings of the hilts of seven swords, suggesting a “chronological sequence of possible development of the earliest rapiers of Transcaucasia, Anatolia and the Aegean.”

194 On the stagnation of sword types in south Caucasia after the Type A see Abramishvili 2001, p. 1: “Regarding the Transcaucasian rapier, there is no evidence traced in the region for further development of this type of weapon.”

4 Chariot warfare, the beginning of militarism and its Indo-European connection

Many aspects of the chariot revolution are now well understood. In his pages simply titled, “The Chariot Revolution,” Barton Hacker reviewed the recent literature dealing with chariots, their construction and maintenance, and the care and training of chariot horses. A chariotry was very expensive, the cost of the horses and the chariots being only a beginning. For his vehicles a ruler fielding even a modest number of chariots needed wheelwrights, joiners, tanners and smiths, all with their own workshops, and for his horses he needed trainers, grooms and stable-boys, veterinarians, either traders or breeders, and tracts of pasture and grain fields.

Most important of all, of course, were the skills required of archer and driver. These skills were spectacular enough that several modern scholars have doubted that an archer standing on a rapidly rolling chariot could even draw his bow, to say nothing of hitting a running target. But that is precisely what many men in the second millennium BC, over months of training and practice, learned how to do. By the Late Bronze Age, Hacker observed, “prowess in the military use of chariots had come to define a new, high-status social group that moved into the highest reaches of royal and imperial governments, completing the social transformation that marked the military revolution wrought by the chariot.”¹

What still needs emphasis is how radical this revolution was in terms of combat. Chariots did not merely provide an edge in battle, but seem to have marked the beginning of battlefield warfare between states. The Sumerian cities and Akkad must have engaged in some kind of *mêlée* warfare against mountaineers or nomads, but among themselves warfare was the mounting or the weathering of a siege. In the Age of Hammurabi a Near Eastern kingdom’s only encounters on a battlefield seem to have been skirmishes against pastoralists or other stateless troublemakers. When a king went to war against another king, the encounter was a siege and the only battle of significance seems to have taken place along the city wall. In siege warfare the opponents tried either to maintain or to break a defensive system. Offensive warfare between states, as opponents tried to destroy or to cripple each other’s offensive capacity, apparently began with the chariot revolution.

Even more broadly, as will be argued in this chapter, chariots seem to have ushered in militarism. A man’s pride in his role as a warrior, in his skills, and in the equipment that he brought to the task, seems to have begun with the driver of

a chariot and the archer who drew his composite bow on a rapidly moving vehicle. There had been warriors in the third and early second millennium BC, but neither in the Near East nor anywhere else were they an elite class. For the rest of the Bronze Age the new military class was to be near, or at, the top of a ranked society.

Chariot warfare and a warrior class

In a long series of articles and books Georges Dumézil argued that in Proto-Indo-European society men were divided into three classes: priests, warriors and producers (artisans and farmers).² Dumézil found such a division especially in ancient India and Italy, but also in early Keltic and Germanic societies. The assumption that a tripartite society was characteristic of the Proto-Indo-European speakers, however, was supported by no archaeological evidence, as Colin Renfrew objected in his critique of Dumézil's interpretation of Indo-European mythologies.³ Although Renfrew put Proto-Indo-European back in the seventh millennium BC, he had no doubt that even if one accepts the "short" chronology and puts the PIE society late in the fourth millennium BC there is no archaeological evidence whatever—in any of the possible PIE homelands—for either the priestly or the warrior class that Dumézil posited. Renfrew was right, so far as I can see, that the tripartite scheme cannot fit the PIE speakers, regardless of where or when one places them.

In the middle centuries of the second millennium BC, however, the existence of a warrior class in several Indo-European subgroups is very clear. For Aryan India it is attested by literary evidence, for considerable parts of temperate Europe by archaeological evidence, and for Mycenaean Greece by all sorts of evidence: documentary, archaeological and literary. There is also ample archaeological evidence for a warrior class in northern Italy in the middle centuries of the second millennium BC. Although Dumézil ignored the time, the place and the circumstances of the warrior class's appearance, he was right to emphasize—as also did Émile Benveniste and other Indo-Europeanists before and since—the existence of an elite warrior class in many prehistoric Indo-European societies.

As I have argued in the preceding chapter, before ca. 1750 BC most of western Eurasia had no warrior class and certainly no military elite. Clearly there was none in the Greek mainland or in temperate Europe, where weapons designed for battle were not yet in use. Neither was there a warrior class—to say nothing of a military elite—in the Near East during and before the Age of Hammurabi. Siege warfare required the service of thousands of laborers, whom royal officials conscripted either from the kingdom's *ilkum*-servants or from its general population. When battles needed to be fought they were fought largely by rural youths, many of whom the kings hired from nomadic pastoralist tribes. Although these hand-to-hand warriors were supported by grants of land or by daily provisions, they were far from an elite. They were simply doing for a king what they had learned to do in order to protect their flocks and herds, and with the same weapons. The only hints of an elite military class in western Eurasia prior to ca. 1750 BC are the spears

and arrows included in chariot burials in the steppe, and the bronze rapiers found under kurgans in southern Caucasia and at several Minoan sites.

The military use of chariots in the second quarter of the second millennium BC, therefore, seems not merely to have revolutionized the way that battles were fought in the civilized world, as I had once supposed, but to have moved warfare from the city wall to the battlefield, and in so doing to have marked the beginning of militarism. During the century and a half after Hammurabi's death offensive warfare began and war was glorified, with the emergence of a class of men whose profession was combat. The members of this class prided themselves on their weapons, their armor, their prowess in battle, and the number of opponents they had killed. Here was the warrior class that Dumézil saw in Indo-European myths. Kristiansen and Larsson have explored in depth the interconnections of this warrior class, with special reference to the Nordic Bronze Age but casting their net over all of western Eurasia.⁴

Membership in this class was neither cheap nor easy. The skills of the chariot archer and chariot driver depended on natural talent and long practice, and the material investment was considerable: the crew not only had to have a chariot and a team of well-trained horses (and perhaps a replacement or two), but also would have an expensive composite bow and scores of arrows to go with it,⁵ bronze rapiers, and leather tunics and helmets covered with bronze scales. For the crewman all of these things were practical and essential, although they also became status symbols for the rich and powerful. Militarism had appeared suddenly, and it led to profound changes over most of western Eurasia.

Our most eloquent evidence for the new outlook comes from India. Chariot warfare continued in India long after it had ended in the Near East and the Aegean, and the *Mahabharata* and the *Ramayana* present vivid descriptions of it. Arthur Cotterell, making excellent use of Indian and Chinese iconography for his very accessible book on chariotry, observed that "representations of Rama nearly always show him armed with a composite bow, not least because prowess as an archer is inseparable from the development of the *Ramayana* tale."⁶ In Vedic, *ratheṣṭha* is an epithet of Indra, and in Avestan a *raθaēšta* is a ruler, but literally is "a man who stands in a chariot."⁷ The hymns of the Rig Veda, dating to the second half of the second millennium BC, are replete with imagery drawn from chariot warfare. These Sanskrit texts take us as far as we are likely to get inside the mind of the chariot archer and driver. Indra, the supreme god of the Aryans, who drinks deep draughts of soma juice and then plunges into battle, is regularly described in the first book of the Rig Veda as driving his heavenly chariot, and his arrows are the thunder-bolts. The mentality of the chariot warrior is especially clear in Hymn 6.75 of the Rig Veda, which Ralph Griffith titled "Weapons of War" in his 1896 translation:

- 1 THE warrior's look is like a thunderous rain-cloud's, when, armed with mail, he seeks the lap of battle.

Be thou victorious with unwounded body: so let the thickness of thy mail protect thee.

- 2 With Bow let us win kine, with Bow the battle, with Bow be victors in our hot encounters.

The Bow brings grief and sorrow to the foeman: armed with the Bow may we subdue all regions.

- 3 Close to his ear, as fain to speak, She presses, holding her well-loved Friend in her embraces.

Strained on the Bow, She whispers like a woman—this Bowstring that preserves us in the combat.

- 4 These, meeting like a woman and her lover, bear, mother-like, their child upon their bosom.

May the two Bow-ends, starting swift asunder, scatter, in unison, the foes who hate us.

- 5 With many a son, father of many daughters, He clangs and clashes as he goes to battle.

Slung on the back, pouring his brood, the Quiver vanquishes all opposing bands and armies.

- 6 Upstanding in the Car the skillful Charioteer guides his strong Horses on whitherso'er he will.

See and admire the strength of those controlling Reins which from behind declare the will of him who drives.

- 7 Horses whose hoofs rain dust are neighing loudly, yoked to the Chariots, showing forth their vigour,

With their forefeet descending on the foemen, they, never flinching, trample and destroy them.

- 8 Car-bearer is the name of his oblation, whereon are laid his Weapons and his Armour.

So let us here, each day that passes, honour the helpful Car with hearts exceeding joyful.

- 9 In sweet association lived the fathers who gave us life, profound and strong in trouble,

Unwearied, armed with shafts and wondrous weapons, free, real heroes, conquerors of armies.⁸

We have nothing like this from the millennium before chariots. Cuneiform and hieroglyphic texts from the Age of Hammurabi and the ages that preceded it glorify gods and kings, but not weapons and warriors.

The Indo-European (and Hurrian) connection

As we have seen in Chapter 3, the new militarism seems to have arisen north and south of the Caucasus, in lands where horses were common. How much of the “horse country” was home to Indo-European languages we do not know, since illiterate societies left no clue. It is quite clear, however, that Indo-European speakers made up a large part—although only a part—of the new military class. Our best evidence for that comes from India and Greece: in both places the entire military class seems to have consisted of men who spoke an Indo-European language. Other evidence comes from the Near East, where many but not all of the early chariot crews were recruited from Indo-Iranian communities.

In the armies of the Hittite and the “Hyksos” kings at least some of the chariot crews were home-grown. Hittite texts describe the training of archers who rode on the chariots of Hattushili I. In Egypt, many of the chariot crews of the early Fifteenth Dynasty presumably spoke the Northwest Semitic language of the Levant. Other crews and trainers in the Near East, however, came from lands where an Indo-European language was spoken. The chariot force that Hattushili met at Aleppo consisted of “Manda” troops, and Manda seems to have been the mountainous country of southern Caucasia. The Indo-Iranian technical terms in the horse-training treatise of Kikkuli are well known. Less well known is that the Akkadian tablets at Nuzi (like those from Kassite Babylon) included Indo-Iranian terms for the colors and ages of horses.⁹

Still more important are the warriors—attested from Anatolia to Egypt—known as *maryannu*. This word attaches a Hurrian suffix to the base *márya* (“hero,” or “young warrior”), which is either an Indo-Aryan or—more likely—a Proto-Indo-Iranian word.¹⁰ Hanoch Reviv, in his study of the term *maryannu*, stated the generally accepted view, with which he agreed:

[T]he *maryannu* were a class of warriors whose expertise in handling chariots and caring for horses was an ancestral tradition which made them the nobility of this region. The privileges and advantages of this class and the role it played were rewards for their ability to use chariots in battle, something which had been previously unknown in this area. The military heritage and social distinction of this class are strongly emphasized in Egyptian and Hittite sources.¹¹

The high status of the *maryannu* was an important novelty, as they were the first recognizable warrior class in the civilized world. No such social distinction had been attached to the slingers, spearmen and archers hired by kings in and before the Age of Hammurabi. The term’s derivation suggests that in the early years of their employment in the Near East many of the *maryannu* came from Indo-Iranian communities.

Many other *maryannu*, however, presumably did not speak an Indo-European language. Instead, as the suffix of the term suggests, their native language was probably Hurrian. The Hurrian language—unrelated to Indo-European—was spoken throughout the drainage area of the Khabur river and also along the upper

Tigris, lands eventually comprised in the Great Kingdom of Mittani. In the second millennium BC Hurrian may have also been spoken, as either a first or a second language, across the Bitlis-Zagros mountains as far as Lake Van (in the first millennium BC the kings at Van used “Urtian”—a late relative of Hurrian—for their inscriptions).

Horses and chariots arrived early in lands where Hurrian was spoken. As mentioned in Chapter 2, already ca. 1800 BC the palace at Chagar Bazar, on a Khabur tributary in northeastern Syria, owned twenty chariot horses and employed grooms and trainers for them. Hurrian speakers were undoubtedly important in bringing chariot warfare to the Near East. The term *maryannu* is one piece of evidence, and equally important is the reputation of Kikkuli. No later than the fifteenth century BC and probably a century earlier Kikkuli wrote or more likely dictated the first and the most respected text on the training of chariot horses, and he did so in Hurrian. The text—in Raulwing’s translation—announced its author in its first line: “Thus [speaks] Kikkuli, the horse trainer from the land Mittani.”¹² At the bidding of one of the early Hittite kings several scribes, whose native language was Hurrian but who also had various levels of competence in Hittite, translated Kikkuli’s instructions from Hurrian into Hittite.

From siege warfare to battlefield warfare

In the Late Bronze Age, as is becoming increasingly clear, battlefield warfare between Near Eastern kingdoms was the clash of chariotries.¹³ We know this from the only Late Bronze Age battles about which we are reasonably informed: the battles at Megiddo in the twenty-second year of Thutmose III, and at Kadesh in the fifth year of Ramesses II. In these battles the opposing chariotries were numbered in the high hundreds or the low thousands. Although there is still some confusion on this point, most historians recognize that the basic chariot crew consisted of a driver (the charioteer) and an archer (the chariot warrior). Far less skilled, and always optional, was a shield bearer. Hittite chariots were apparently built to accommodate a shield bearer as a third man, but in Egypt and elsewhere the chariot carried only a driver and an archer.¹⁴ Men on foot seem to have played only a supporting role. Camps were guarded by lines of men, each with a shield and spear, and chariots in action were assisted by “runners,” men on foot who were armed with a spear and/or a short sword and whose duty it was to protect their own crewmen or to dispatch enemy crewmen whose vehicles had been disabled. Cities of course continued to be besieged, and the siege required large numbers of laborers, but now the siege of a city followed the defeat of its chariotry in the open country.

In essence, chariots seem to have brought about the progression from siege warfare to battlefield warfare. By 1750 BC horse-drawn chariots had been known for over 200 years, first on the steppe and then in the Near East, where royalty acquired them for sport and promenade. As a transport for an archer, the chariot opened up new possibilities for hunting not only swift prey but also dangerous predators. At least through the time of Hammurabi, however, in Mesopotamia,

the Levant and Egypt it had not yet been used against men. Because the initial role of the military chariot in the Near East is not described, we will have to imagine it. When Hammurabi or one of his contemporaries decided to besiege a city that had rejected his ultimatum, he assembled an ÉRIN.MEŠ and sent it out against the recalcitrant city. Proceeding some 15 miles a day, it would slowly have made its way toward the target city. The king of the threatened city could try to thwart or at least delay the long column by setting an ambush at a place where the terrain offered concealment. Once the concealed archers and slingers had exhausted their missiles, however, they were themselves in danger, as the spearmen included in the ÉRIN.MEŠ rushed toward them. The ambushers would have been a long way from the safety of their city gate.

Chariots will have changed all of this. Instead of setting an ambush the king of a threatened city could send out his chariots, ordering the archers continually to harass the ÉRIN.MEŠ as it lumbered along. Shooting their arrows from a distance of well over 100 m, the archers—in no danger themselves—would have killed some and injured many more of the men in the siege train. If the ÉRIN.MEŠ nevertheless reached its destination and the siege commenced, the chariots would have continued to harass the besiegers encamped around the walls and would also have disrupted the supply trains bringing rations and material for the thousands of laborers erecting the siege tower and siege ramp.

In order to deal with the defenders' chariots a king intent on conducting a siege would have needed chariots of his own. In addition to fending off enemy chariots *en route*, they would have been used—once the siege began—for patrolling the wall and chasing down messengers who escaped from postern gates or were let down from the wall. Because chariots were so useful both for the besieged and the besiegers, within a short time after their military introduction every king in the Near East must have acquired at least a small chariot force. When chariots clashed they necessarily did so out in the open, away from the wall of a city and the siege ramp raised against it. So began battlefield warfare between Near Eastern kingdoms.

The new kind of warfare was followed by improvement in weaponry and by employment of defensive armor. In the Age of Hammurabi the composite bow, which had twice the range of a self bow, had been known for at least a millennium. Because it was expensive, however, its manufacture was uncommon. That changed with chariot warfare. The cost of a chariot and a team of horses trained to pull the chariot, to say nothing of the value of the chariot's two crewmen, persuaded some kings that provision of composite bows for their chariot archers was a prudent investment. Other kings necessarily followed suit. To protect themselves against the more lethal arrows, the chariot crews found it necessary to wear heavy armor: leather helmets and corselets, with hundreds of bronze scales sewn to the leather.¹⁵ The corselet (the *sariam* in Hurrian) was typically a tunic reaching to the lower leg.

The beginnings of chariot warfare in Anatolia

Although in Egypt, the Levant and Mesopotamia the military use of chariots does not seem to have begun until later, we have reason to think that in Anatolia it may

have begun as early as 1750 BC. Some fragmentary texts mentioning Anum-herwa of Mama (Mama seems to have been a city not far from, and in competition with, Kanesh) also mention “foot-soldiers and charioteers,” and Anum-herwa came to power in the fifth year of Zimri-Lim (1770 BC). It is not clear, however, whether the texts date to Anum-herwa’s own time or whether they are much later and belong in the category of “Sacred Lore Literature.”¹⁶

More certain evidence comes from the “Anitta text,” a text that originally stood in a three-part display inscription at the city first called Kanesh, then Nesha, and now the site of Kültepe (“ash mound” in Turkish). In the eighteenth century BC Kanesh was easily the largest city in Anatolia, and the seat of a Great Kingdom. In the text Anitta declares (§9, Beckman) that he set up his inscription at the city’s main gate. Anitta is mentioned in several Akkadian tablets from the *karum* of Period 1b at Kültepe, and his name is incised on a bronze spearhead from the same stratum. The 1b *karum* was burned ca. 1740 BC, indicating that Anitta was a contemporary of Ishme-Dagan, son of Shamshi-Adad I, and active ca. 1750 BC.¹⁷

Anitta’s proclamation may have been the first inscription ever set up in the “Hittite” language (more correctly, “the language of Kanesh”). Anitta was a Great King, and although his roots were in the small city of Kuššara, his father had captured Kanesh and had made it his capital. Anitta enlarged his father’s realm. Toward the beginning of his inscription he boasts that he had conquered Hatti and destroyed the city of Hattusha, cursing anyone who dared to rebuild the city (either Labarna or Hattushili rebuilt it with impunity). The “Anitta text” became a classic for Hittite scribes (it was very likely the oldest Hittite text they had), and we have three copies of it on clay tablets, one copy made in the sixteenth century BC and the other two in the thirteenth. Gary Beckman has provided a new translation of this important text,¹⁸ and below is his translation of four sections of Inscription C:

§15 (A 57–8) I furnished the temple of Ḫalmašuit, the temple of the storm-god, my lord, and the temple of our deity with the goods I brought back from campaign.

§16 (A59–63) I made a vow, and I [went] hunting. In a single day I brought to my city Neša 2 lions, 70 swine, 60 wild boars, and 120 (other) beasts—leopards, lions, deer, gazelle, and [wild goats].

§17 (A 64–67) In the same year I went to war against [Šalatiwara]. The ruler of Šalatiwara set out together with his sons and came [against me]. Leaving his land and his city, he took up a position on the Ḫulanna River.

§18 (A 68–72) [But the army] of Neša went off behind [him], set fire to his fortifications, and [. . .] them. The besiegers of the city (Šalatiwara) were 1,400 infantry and 40 horse-drawn [chariots]. He (the ruler of Šalatiwara) gathered up [his treasure] and departed.

We can be fairly sure that Anitta had chariots that carried skilled archers. The Great King boasts that he went out on a hunt and in a single day brought back

to Kanesh (the carcasses of) lions, leopards, wild boars and scores of other animals. Such a feat would have been possible only if Anitta and a fair number of archers went out on their hunt in chariots. More explicit, although including a reading debated by Hittitologists, is the mention of forty chariot teams at Šalatiwara, a city that apparently lay near the Sakarya (Sangarios) river in north-western Anatolia. Erich Neu, adhering closely to the texts, regarded the 1400 men on foot and the forty chariot teams as the force that the king of Šalatiwara had left behind to defend his city.¹⁹ Philo Houwink ten Cate disagreed, and concluded that the forty chariot teams were part of the booty that Anitta took out of Šalatiwara. Although Houwink ten Cate acknowledged that the three copies of the text seem to involve the chariot teams somehow in the siege of the city, he believed that the copyists must have misunderstood the original inscription. Houwink ten Cate came to this conclusion because he believed that in Anitta's day chariots were not yet used militarily.²⁰ That argument is no longer valid. What has been found in the graves at Sintashta suggests that long before Anitta's day chariots on the steppe were used in combat. Gary Beckman reads the forty chariot teams as part of the force that Anitta commanded in besieging the city. Because Anitta's hunting feat makes it fairly clear that he had chariots and chariot archers, Beckman's interpretation is probably correct. Although some of this remains uncertain we must conclude that in Anitta's part of Anatolia at least small chariotries were apparently being used militarily already by the middle of the eighteenth century BC.

By ca. 1650 BC chariot warfare was well under way in Anatolia and elsewhere in the Near East. Cuneiform texts in Hittite and Akkadian show that Hattushili I, the Great King of Hatti, had a large chariotry of his own and also confronted chariots in battle.²¹ Although the precise regnal dates of the Hittite kings are uncertain, the approximate dates for Hattushili I are ca. 1640–1610 BC.²² Hattushili was the first to rule from Hattusha and is generally thought to have created the Great Kingdom over which he ruled. As clearly stated in the “Proclamation of Telepinu,” however, Hattushili was the second king in the dynasty, having been preceded by a shadowy Labarna. Massimo Forlanini has brought some light to the shadows, making a good argument that Labarna—not a title, but a proper name—ruled from Kanesh, and that Hattushili was his nephew and his heir (and as such brought “the language of Kanesh” to Hatti).²³ Forlanini's reconstruction would date most of Labarna's reign at Kanesh to the second quarter of the seventeenth century BC.

The texts say nothing about Labarna's army, but they leave no doubt that Hattushili employed military chariots, and evidently quite a lot of them. Richard Beal has pointed out that two of Hattushili's officers bore the title, “Overseer of One Thousand Chariot fighters.”²⁴ That suggests that at a minimum Hattushili had several hundred chariots at his disposal. If ca. 1750 BC Anitta had forty military chariots, by ca. 1650 BC chariotries had grown tenfold.

A text pertinent to Hattushili's chariotry is the *Siege of Urshu*. This text of about seventy lines has been thoroughly analyzed and re-translated by Gary Beckman.²⁵ Most of the text is in Akkadian but two sentences are in Hittite. The original was

probably composed in Hittite during the Hittite Old Kingdom.²⁶ The text presupposes that Hattushili's generals are besieging Urshu, which probably was located not far from Ebla, and are not having much success. The first few lines on the reverse side of the tablet refer to the capture of thirty chariots from another enemy city.²⁷ In a longer exchange between Hattushili and his generals we hear about the Great King's own chariots:

While they did nothing to the city, many servants of the king were hit, and many died. The king became angry and said, "Guard the roads—keep watch on those who would enter the city and on those who would go out of the city! Let no (one) go over to the (other) enemies—to the city Zaruar, to the city Aleppo, to the Hurrian army, or to Zuppa!" They replied, "We will be on guard. Eighty chariots (and) eight armies encircle the city. May the heart of the king not be troubled. I am in place." Then a fugitive came out of the city and said: "The servant of the man of Aleppo has entered five times; the servant of Zuppa is present in the city; the men of Zaruar go in and out." . . . The king became angry.²⁸

The eighty chariots patrolling the wall of Urshu were evidently supposed to prevent such surreptitious flights to or from the city. Like Hittite chariots in a later period,²⁹ Hattushili's chariots were mobile platforms for archers, armed with either self or composite bows. The "Anecdotes Text," dating from the Old Kingdom, includes an anecdote about the training of archers: after learning the necessary skills, from holding the bow to sharpening the arrowheads, the trainees shoot before the king:

When they shoot before the king, he who hits the mark, to him they give wine to drink. They [. . .] the king. But he who does not hit the mark, to him they give a bitter (?) cup. There he runs the review naked.³⁰

Also relevant are entries in the *Annals of Hattushili* (or the *Deeds of Hattushili*).³¹ In Hattushili's account of Year 4 in the *Annals* he claims to have driven off chariots "of the country of Abbaya" when they attacked him *en route* from Sanahuitta to Hattusha.³² Although Sanahuitta's location is uncertain, Trevor Bryce believed that it lay to the northeast of Hattusha.³³ In the Year 6 entry of his *Annals* Hattushili boasts of sacking the city of Hassu (or Hassuwa) in Syria, and bringing back much gold and silver for the gods and goddesses of Hatti.³⁴ Hassu was one of the cities that owed allegiance to the kingdom of Yamhad, centered at Aleppo, and the Great King of Yamhad sent an army to aid his vassal against Hattushili's aggression. The two forces met near Mt. Atular (Adular), and after defeating his opponents Hattushili crossed the Purana river and proceeded to Hassu. The Mt. Atular battle was of course fought in open country.³⁵ That Hattushili's opponents relied on at least one chariotry and perhaps two we learn from another text relating to the destruction of Hassu: the "Zukrasi text," one of the earliest texts in Hittite that archaeologists have thus far recovered. In Houwink ten Cate's translation this text reads:

Zaludis, the commander of the Manda-troops, (and) Zukra(s)sis, the commander of the heavy-armed (?) troops [of the Ruler (?)] of Aleppo came down from Aleppo with the foot-soldiers and his charioteers.³⁶

The Manda-troops, the *umman-manda*, to whom this text refers almost certainly manned chariots because in the only other reference to Manda-troops in Hittite documents they are quite clearly a chariot force.³⁷ That in the middle of the seventeenth century BC the king of Aleppo was apparently employing chariot troops from Manda is a point to which we shall return.

The Hyksos dynasty and the beginnings of chariot warfare in Egypt

Chariot warfare in Egypt seems to have begun ca. 1675 BC. The Fifteenth Dynasty in Egypt, the so-called “Hyksos” dynasty, has been conventionally dated from ca. 1650 to ca. 1540 BC but new evidence raises the date of the dynasty’s commencement. The Egyptian term *heqau khasut* meant “rulers of mountainous—i.e. foreign—lands.”³⁸ Archaeological evidence comes mostly from Avaris, in the eastern Delta. In their palace at Avaris the “foreign kings” ruled both Lower Egypt and the southern Levant, from which they had come. This unprecedented turn of events—a foreign dynasty establishing itself in Egypt—seems to have been made possible by the advent of military chariots.

It is regrettable that from Egypt under the Fifteenth Dynasty we have almost no inscriptional evidence.³⁹ Whatever inscriptions the *hyksos* kings may have set up were destroyed by their Theban successors. Thanks only to the boasts of his opponent, we know that Apopi—the last significant king of the Fifteenth Dynasty—had military chariots. The Theban Kamose, the last ruler of the Seventeenth Dynasty, battled successfully against Apopi shortly before 1550 BC and in his victory taunts he twice referred (on his first and his second stela) to the horses of “the vile Asiatic.”⁴⁰

The role of the “foreign kings” in introducing the chariot to Egypt (which for 2000 years had managed well enough without wheeled vehicles of any kind) has long been assumed and has recently been restated by Anja Herold. In her study of Egyptian chariot technology Herold states without further ado that chariots came to Egypt “erst während der ersten Fremdherrschaft in der Geschichte des Pharaonenlandes, in der Hyksoszeit,” and that the Fifteenth Dynasty kings seem to have had horses and chariots from the very beginning.⁴¹ That the “foreign kings” had chariots from the outset is indicated most vividly by the skeleton of a horse killed ca. 1675 BC during a Kushite storming of the fortress at Buhen, near the Second Cataract of the Nile and so on Middle Kingdom Egypt’s southern border.⁴² As described by Walter Emery, who led the expedition that excavated the site,

Fortress Buhen was probably the administrative centre for the whole of the fortified region of the Second Cataract. With the fortified settlement of Kor, 4.5 km. to the south, Buhen controlled the first navigable stretch of the Nile north of the cataract, which was impassable for ships of any size.⁴³

The horse's skeleton was found directly on the pavement where it had apparently been stalled: between the third and fourth tower of the fortress's west wall. Juliet Clutton-Brock's analysis of the skeleton showed that the horse—about 19 years old and more likely a gelding than a stallion—had been controlled by a hard bit, probably of bronze.⁴⁴

That chariotry had come to Egypt from the Levant is fairly clear. When Egyptian chariots are finally displayed, in temple reliefs from the Eighteenth Dynasty, they appear to be virtually identical to those used in the Levant. Along with the chariot itself came the vocabulary for it. In reference to the many loan-words that came into the Egyptian language from "Canaanite" during the Second Intermediate Period and the New Kingdom, Donald Redford observed that "fully one-quarter of those terms that can be identified have to do with the military. Technical expressions describing the chariot, its parts and accoutrements, account for half of these."⁴⁵

Metal bits, much more effective than organic bits, are reasonably supposed to have been produced in order to keep panicked horses under the driver's control during a chariot battle. When Flinders Petrie found the first of these metal bits at Tell el-Ajjul, near Gaza, in a context that he dated to the Second Intermediate Period, he called it a "Hyksos bit," because the Fifteenth Dynasty kings were known to have controlled the region. Littauer and Crouwel argued that all metal bits, including the one from Tell el-Ajjul, dated no earlier than 1500 BC, and that "the Hyksos" therefore had nothing to do with the "Hyksos bit."⁴⁶ The bit-wear on the Buhen horse, from ca. 1675 BC, challenges that conclusion. More decisive is the recent discovery of a copper "Hyksos" bit at Tel Haror (again close to Gaza) in an MB III ceramic context,⁴⁷ and so between 1700/1650 and 1550 BC. Petrie was apparently right after all: metal bits were probably first produced under the "foreign kings" who ruled northern Egypt and the southern Levant.

An even more recent discovery shows that the chronology of the *hyksos* rulers of Egypt must be raised by a generation, and that their authority (or at least their influence) extended into Upper Egypt. At Edfu, upstream from Thebes, archaeologists found a cache of forty-one scarab sealings bearing the name of Khayan, the most famous of the Fifteenth Dynasty kings, and the cache dates ca. 1675 BC, far earlier than Khayan's reign has usually been dated.⁴⁸ This new light on the Fifteenth Dynasty has a direct bearing on the Buhen horse. The skeleton of the chariot horse found at Buhen, and stratigraphically dated ca. 1675 BC, is almost certainly to be associated with "the foreign kings."⁴⁹

The expulsion of the *hyksos*, like their arrival, was implemented by chariots, this time those that were under the command of Kamose and Ahmose, his brother and successor and founder of the Eighteenth Dynasty. Egyptologists have long known that Ahmose had chariots, but only recently have they had graphic confirmation of this fact, and of Ahmose's pride in his charioteering. This we owe to Stephen Harvey's excavations and investigations at Abydos, where the king chose to build his pyramid and mortuary complex.⁵⁰ By laboriously reassembling hundreds of limestone fragments scattered about at Abydos, Harvey has shown that Ahmose's pyramid temple featured a relief displaying Ahmose as a colossal chariot warrior

routing his Asiatic opponents in their chariots.⁵¹ It is well known, of course, that later kings of the Eighteenth Dynasty were keen to portray themselves in a battle chariot, acting as both archer and driver and slaughtering the enemies of Egypt. What we can now say, thanks to Harvey, is that this was the centerpiece of royal propaganda at the very beginning of the dynasty. This is what warfare was ca. 1550 BC, certainly in Egypt and *ipso facto* in the Levant, whence chariotry had come to Egypt. The contrast between chariot warfare and siege warfare is stark. Wars were now fought on battlefields, and along with that came military glory, whether real or feigned.

A thesis and some antecedents

The consequences of chariot warfare for the Near East, and the Indo-European speakers' role in it, are recognized by many historians. What is not recognized, but is central to this book, is what the advent of chariot warfare meant for Europe, where society was still at the pre-state-level and people lived in villages or unwalled towns. As will be seen in Chapters 5 and 6, plenty of *in corpore* or other archaeological evidence shows that in Europe a warrior class with chariots made its initial appearance soon after the Age of Chariots began in the Near East. It cannot be proven that the men of that class in Europe were intruders rather than natives, but circumstantial evidence makes such a conclusion almost unavoidable. Men of the new military class, that is, apparently conquered several attractive and defenseless lands in Europe. Many and probably most of these men came either from the Eurasian steppe or from southern Caucasia, lands where I assume that various Indo-European languages were spoken. And that, I will argue, is how Europe was Indo-Europeanized. The thesis has obvious similarities to Gimbutas', but places the arrival of military intruders in the second millennium BC rather than in the fifth, fourth and third, and has at least some of them on chariots. Although I do not explore it here, the Indo-Europeanizing of northwest India evidently happened at the same time and in the same way.

Much of this argument is not new. In 1970 William Wyatt's "The Indo-Europeanization of Greece," agreeing with John Chadwick and other linguists that the Greek language could hardly have begun to form before the beginning of the second millennium BC, proposed that Greek began when Indo-Europeans—with chariots—arrived in Greece at the end of the MH period. My *Coming of the Greeks* made a similar argument at greater length, although with no greater success. Long before these publications the spread of the Indo-European languages had occasionally been tied to chariots. In the Indomania of the early nineteenth century some British and German Indologists, taking their cue from the Rig Veda, wondered whether horse-drawn chariots may have been important for the success of "the Aryans" in their various conquests. Impressed by the fact that the several branches of Indo-European had inherited from PIE not only a word for horse, but also words for wheel, axle, thill and wagon, linguists proposed that "the Aryans" had invented the chariot. These early views also included, of course, the usual assumptions about folk migrations and the racial superiority of "the Aryans."

By the 1880s speculation about Aryan chariots was waning. Yes, PIE had a word for horse and for wheels and wagons, but the wagons were drawn by oxen, the chariot was invented in Mesopotamia, and the PIE speakers' horse was only a food animal. This change of opinion was in large part due to the 1870 publication of Victor Hehn's research on the history of plant and animal domestication.⁵² Some but not all of Hehn's conclusions were valid, and the result was that the Indo-European speakers' connection with chariots was minimized.

The connection was in a few quarters restored in the early twentieth century, thanks to the excavations that Hugo Winckler began at Boghazköy in 1906. Akkadian tablets from the site referred to Aryan gods and Aryan kings in Mittani, several of the kings having names compounded with *-āšva* (horse) or *-ratha* (chariot). This showed that in Mittani the Hurrian populace had Aryan-speaking rulers, and it suggested once again that the expansion of the Indo-Europeans may somehow have been connected with their possession of horses and chariots. Eduard Meyer made that point in the second (1909) edition of his *Geschichte des Altertums*.⁵³ A few years later Hrozný's decipherment of Hittite as an "Indo-European" language, and the Hittites' dependence on chariotry, added support for a connection between chariotry and the Indo-European expansion. Unfortunately, by the 1920s the belief was strong and widespread that "the Aryan race" was indigenous to northern Europe, and it was not easy to fit a chariot-borne expansion into that belief.

Perhaps the best work on the subject was done by Gertrud Hermes, an outsider who had no intention to extol the Aryan race.⁵⁴ In a series of meticulous articles in the 1930s Hermes showed very clearly that the attribution of "tamed" horses to northern Europe (or, for that matter, to any other part of Europe) in the Neolithic and Early Bronze periods was unfounded. She then went on to argue—here she conceded that the evidence was circumstantial—that in the second millennium BC Europe was Indo-Europeanized by conquerors from the Pontic-Caspian steppe who depended on their tamed horses.⁵⁵ Hermes concluded that the Indo-Europeans, after borrowing chariot technology from the Hurrians, conquered central Anatolia and established the Hittite kingdom, whose kings promptly sacked Babylon.⁵⁶ At about the same time, attracted by the wealth of the Cretan Aegean, the Achaeans took over the Greek mainland and set up kingdoms there.⁵⁷ Early Mycenaean art, Hermes observed, spoke clearly about the Achaeans: "Dating from the Early Mycenaean period, it characterizes these people at their entry into history as a warrior nation, whose mode of warfare depended on the horse and chariot."⁵⁸ Hermes found it *unverständlich* that although archaeologists had plenty of evidence for a new and warlike population in the Aegean, they continued to scrutinize pottery for clues about a change in ethnicity.⁵⁹ After Greece was Indo-Europeanized, so was much of temperate Europe. Following the trail of antler cheekpieces, Hermes concluded that by the middle of the second millennium BC Indo-Europeans had sought out and conquered especially the metal-rich regions of central Europe,⁶⁰ arriving in northern Italy and the amber lands of northern Europe not much later.

Parts of Hermes' reconstruction I must reject. She reckoned with a Hittite invasion of Anatolia, she believed that Hurrians invented the chariot, she supposed

that the Achaeans were not familiar with seafaring until long after their arrival in Greece, she dated their arrival at the beginning rather than the end of the MH period, and she believed that the Indo-Europeans who took over much of temperate Europe were riders rather than charioteers. In other respects, however, her explanation of the Indo-Europeanizing of Greece and central Europe strikes me as very much on target. What she wrote was soon condemned in Germany and scarcely read anywhere else.

Another radical appraisal of the advent of chariotry came from Oswald Spengler, years after he had published his grandiose *Untergang des Abendlandes*. Although not much interested in the Indo-Europeans, their language or their homeland, Spengler was fascinated by the changes in human society that followed inventions and innovations (the bow, for example, or sea-going ships). In one of his last presentations Spengler declared, with characteristic drama, that the chariot not only revolutionized warfare but in fact revolutionized the world.⁶¹ “No weaponry, not even gunpowder, had such consequences for the world as did the chariot. It is the key to the world’s history in the second millennium BC, the millennium which—of all the millennia in recorded history—most changed the world.”⁶² Spengler supposed that the chariot was pioneered by the several peoples (some but not all of whom spoke Indo-European languages) living on the steppes of central Asia. The chariot was “die erste Tempowaffe der Geschichte” (armed riding was “nur die Konsequenz aus dem Streitwagenkampf”), and it fundamentally changed the concept and conduct of warfare. Although he did not include temperate Europe in his survey of lands affected by the advent of chariotry, Spengler saw the new warfare as responsible for historic changes elsewhere: the Aryan conquest of India, the Achaean conquest of Greece, the Hyksos conquest of Egypt, the Kassite conquest of Mesopotamia, and—some centuries later—the Zhou conquest of Shang China.

Most importantly for the argument of the present book, Spengler saw in chariot warfare the birth (biological metaphors appear often in his work) of militarism, which he celebrated:

Along with the weaponry came a new kind of man. A delight in daring and adventure, in personal bravery and in a knightly ethos, asserted itself. Ruler-races made their appearance, made up of men who considered warfare as their way of life, and who looked down with contempt upon the castes of farmers and stockmen. Here, in the second millennium BC, we hear men’s voices that had not been heard before. A new kind of soul was born. From that point on there has been heroism, conscious of itself.⁶³

In place of the administrators and priests who earlier had made up the ruling class in Egypt and Mesopotamia there now appeared a military elite, and war became the profession of the ruling class.⁶⁴ Spengler intended to elaborate upon this theme in his *Frühzeit der Weltgeschichte*, but died before completing that work. Spengler’s reputation declined steeply after the Second World War, and subsequent scholarship on the chariot and chariot warfare has almost completely ignored his “amazingly correct” thesis about the *Streitwagen* revolution.⁶⁵

During the last 75 years a tie between the origins of militarism and the spread of the Indo-European languages has seldom been explored. Gimbutas' Kurgan theory was the great exception, but its version of military history was deeply flawed and other versions have not been seriously considered. In part this may be because prehistorians have stayed as far as possible from the *histoire événementielle* so despised by Braudel and the Annales School (and not of much interest to the New Archaeology either). And as war with chemical, biological and nuclear weapons has become abhorrent, the academy has looked more often and more closely at the sociology and "culture" of war than at combat itself.⁶⁶ Today the dominant theories about the spread of the Indo-European languages are apparently those put forward by Colin Renfrew and David Anthony. Anthony, as we have seen in Chapter 2, has de-militarized Gimbutas' Kurgan theory, and Renfrew's theory has no place for war and conquest. Even Elena Kuz'mina's recent book on the origin of the Indo-Iranians, while furnishing them with horses and chariots, does not bring the Aryans into India as belligerents, and much less as conquerors.

While the decline of military history has contributed to the absence of chariot warfare in scholarship on the Indo-Europeanizing of Europe, another important contributor has been the general assumption that temperate Europe was Indo-Europeanized very early: a millennium or two or possibly even three before chariot warfare began. In the 1930s the belief was well established and widespread—contra Hermes, Spengler, Childe (with qualifications) and several other objectors—that the Indo-European languages were indigenous to northern or central Europe. That belief, based on racial assumptions, survived for a decade or two after the Second World War. Giacomo Devoto's *Origini indoeuropee*, a book based on work done mostly in the 1940s and early 1950s, equated the Indo-European homeland with the Linearbandkeramik culture, an archaeological culture that in the fifth millennium BC stretched from the lower Rhine to the middle Danube.⁶⁷ Pedro Bosch-Gimpera put the *satem* homeland in the Pontic-Caspian steppe, but kept the *centum* homeland in central Europe, north of the upper Danube (whence, at the beginning of the second millennium BC, proto-Greeks moved southeast into Greece).⁶⁸ Obviously neither Bosch-Gimpera nor Devoto supposed that horses and chariots were a factor in the Indo-Europeanizing of Europe. Gimbutas, in contrast, made much of the Indo-Europeans' dependence on horses and she placed the IE homeland firmly in the Pontic-Caspian steppe. With her Kurgan theory, nevertheless, she had much of Europe speaking Indo-European languages all through the third millennium BC and parts of it already by the end of the fifth. Anthony does the same, and Renfrew synchronized the Indo-Europeanizing of Europe with the beginnings of agriculture. Since the 1930s it has seldom been considered that Indo-European languages were not brought to most of Europe until well into the second millennium BC.

What I am arguing here is that the beginnings of militarism, an immediate consequence of the use of chariots to kill men, led to the Indo-Europeanizing of much of Europe. Although Spengler did not include temperate Europe among the lands conquered by the new military elite (his *Waffenadel*), I believe that we now have enough evidence to make that case. It was long argued by Gimbutas that

parts of temperate Europe were dominated by warriors on horseback already in the fourth millennium BC, but that idea has been mostly and rightly abandoned. Archaeological evidence suggests that although atrocities were committed from time to time in Europe, pitched battles did not occur until well into the second millennium BC. Until late in the Bz A2 period the long-range weapons in Europe were the self bow and the sling, and when a hand-to-hand *mêlée* did occur battle-axes and daggers must have sufficed. Every man was the protector of his own family and belongings, and there was not yet a warrior class in Europe. Then things changed, and the change coincided with the arrival from the east of the “tamed” horse and the chariot. Across western Eurasia not all of the men involved in this innovation spoke an Indo-European language, and many (possibly even most) Indo-European speakers knew nothing at all about chariot warfare. But apparently the Indo-European connections with the new militarism were substantial enough to change the linguistic map of Europe.

Notes

- 1 Hacker 2012, p. 182.
- 2 The tripartite society and the place of the warriors is described at length in Dumézil’s *Aspects de la fonction guerrière chez les Indo-Européens* (Paris: Presses Universitaires de France, 1956), and his *L’idéologie tripartite des Indo-Européens* (Brussels: Latomus, 1958). Parts of the thesis, however, had been put forward in two small books already in the 1930s: his *Ouranos-Varuna: étude de mythologie comparée indoeuropéenne* (Paris: Maisonneuve, 1934) and *Flamen-Brahman* (Paris: Geuthner, 1935). A more developed thesis then appeared in a short article: Dumézil’s “La préhistoire des flamines majeurs,” *Revue d’Histoire des Religions* 118 (1938), pp. 188–200. For one historian’s critique of Dumézil’s reconstruction of Indo-European society see Momigliano 1984. For a more positive appraisal see Mallory 1989, pp. 130–135.
- 3 Renfrew 1987, pp. 250–262.
- 4 Kristiansen and Larsson 2005, pp. 170–250. For a succinct presentation of the argument see Kristiansen 2006.
- 5 On the time and materials required for the manufacture of composite bows see Drews 1993a, p. 110.
- 6 Cotterell 2004, p. 152. Pp. 142–176 in Cotterell’s book are devoted to a survey of the evidence for chariot warfare in Indian art as well as literature.
- 7 On these archaic compound nouns see Witzel 2003, p. 27 with footnote 119. See also Witzel 2001, p. 9.
- 8 Ralph T. H. Griffith, translator, *The Hymns of the Rig Veda* (Benares: E. J. Lazarus, 1896). At Drews 1993a, p. 125, I quoted—to no avail—several verses of this hymn in Wendy Doniger O’Flaherty’s 1981 translation. For a review of Vedic evidence on the Indian chariot in ritual see Sparreboom 1985. For its use in warfare see Singh 1965, pp. 10, 26 and 31.
- 9 Raulwing 2009, p. 7.
- 10 This term, the names in the treaty between the kings of Hatti and Mittani, and the technical terms in the Kikkuli treatise, are often regarded as Indo-Aryan rather than Proto-Indo-Iranian (that is, Proto-Aryan). For arguments along that line see Thieme 1960. Although the terms and names are much closer to Vedic than to Avestan, I remain persuaded by Kammenhuber 1968 that the similarity is due to the conservative character of Indo-Aryan versus the innovative character of Iranian. Kammenhuber concluded that the names and terms come from a period before Proto-Aryan divided into its Indian

and Iranian branches. For a good discussion of the relationship between Vedic Sanskrit and the Indo-Iranian terms familiar in Mittani see Witzel's "Telling absences: lack of Indian characteristics west of India" (section 11.16 in Witzel 2005). Witzel there concludes that "the Mitanni documents do not show any typical *South Asian* influence. These remnants of IA in Mit. belong to an early, pre-R̥gveda stage of IA."

- 11 Reviv 1972, p. 219. The Aryan origin of the term *maryannu* was early emphasized by William Albright (Albright 1930). For mild objections see Raulwing 2000, pp. 117–118, continuing Littauer's and Crouwel's attempts to minimize the Indo-European connection with chariots.
- 12 Raulwing 2009, p. 3.
- 13 See, for example, Richter 2004, p. 507, in his survey of all cuneiform sources on chariotries, or Vita 2008, p. 57, with special reference to the Alalakh, Amarna and Ugarit archives. All of the armor and armament mentioned in the Nuzi tablets seem to have been meant for chariot forces.
See Maidman 2010, pp. 37–38, on a costly battle in which one wing of a Nuzi chariot contingent seems to have lost thirty-four of its fifty-eight chariots.
- 14 Not all historians are yet on board with this description. Spalinger 2005 assumes that New Kingdom warfare was primarily an infantry encounter, and that the portrayal of the pharaoh in battle reliefs (here the pharaoh dispenses both skill positions, using his hands to draw the bow while driving the chariot with the reins tied round his waist) is not flattery of His Majesty but rather a realistic portrayal of a typical Egyptian charioteer. Recognizing how difficult it was for one man to perform both skills simultaneously, Spalinger suggests that chariot battles were to some degree games, with rules of engagement accepted by both sides. See Spalinger 2005, p. 30, fn. 31:

I still feel that the use of reins tied behind the back by the chariot driver would have led to major problems. Instead, can we propose that chariot attacks, outside of surprises such as happened under Ramesses II at Kadesh in Dynasty XIX, were more of a "set piece" in which the two opposing chariot divisions were permitted to attack each other? If so, each would have avoided the almost suicidal results of such a measure. This speculation is not too far-fetched insofar as other epochs of human history have allowed their elite warriors a high degree of formal, or "ludic," behavior in war.

- 15 Lion 2008, p. 75, agreeing with Timothy Kendall's excellent 1974 dissertation on the military tablets from Nuzi, states that helmet and corselet (*sariam*) together were covered by more than 1000 bronze scales, weighing as much as 18 kilos.
- 16 On the fragments see Houwink ten Cate 1984, p. 59. On the date for Anum-herwa's accession see Forlanini 2004, pp. 369–370.
- 17 See Neu 1974, pp. 1–2. Neu concluded that Anitta reigned "nach der Kurzchronologie in die zweite Hälfte des 18. und Beginn des 17. Jh.s v. Chr." In the middle chronology these dates are raised by 64 years.
- 18 Beckman 2006.
- 19 For Erich Neu's translation see Neu 1974, p. 15 (his italics indicate that the reading is not entirely certain): "Die *Einschliessung* der Stadt (bestand in) 1400 Fusstruppen und 40 Pferdegespanne." Neu regarded the forty chariot teams as part of "die vom Fürsten von Šalatiwara in seiner Stadt zurückgelassenen Schutztruppen" (Neu 1974, p. 34).
- 20 Houwink ten Cate 1984, pp. 59 and 80–81, n. 66.
- 21 A synchronism between Hattushili and the first military chariots in the Near East seemed correct 25 years ago (Drews 1993a, p. 106, notes 5 and 6), and although now doubtful still has some support. In his survey Thomas Richter 2004, p. 510, noted that chariots are mentioned several times in texts pre-dating Hattushili's reign.

Die Zahl der sicheren Belege ist für das 18–17. Jh. v. Chr. jedoch so klein, dass der erste nennenswerte Kampfeinsatz mit Streitwagen allgemein erst in die Zeit um 1600 v. Chr. angesetzt wird, als hethitische Kräfte nach Halab, das heutige Aleppo, vorstießen.

- Richter uses the low Mesopotamian chronology, 64 years lower than the middle.
- 22 It is unfortunate for historians that Hittite scribes, unlike their Egyptian counterparts, left no records of the number of years that the various Hittite kings ruled, and Hittite chronology is therefore unusually vague (see Beckman 2000). Mesopotamian chronology is more helpful, and on the middle Mesopotamian chronology followed in this book the city of Babylon was captured and sacked by Murshili, the successor of Hattushili, in 1595 BC. If we assign Hattushili a notional 30-year reign, he would have reigned from ca. 1640 to 1610 BC.
 - 23 Forlanini 2004 makes a convincing case in overturning some traditional views on the beginnings of the Great Kingdom of Hatti. Forlanini proposes that Labarna of Kanesh, after conquering Hatti, rebuilt the ruined city of Hattusha and installed his brother as the new city's petty king. The brother, begetting a son, proudly named him Hattushili—"the man of Hattusha"—and when the brother died Hattushili succeeded to the petty kingship of Hattusha. Late in life, so Forlanini proposes, Labarna chose his young nephew to succeed himself as Great King. It was thus that the Great Kingship moved from Kanesh to Hattusha, bringing with it the language of Kanesh.
 - 24 In his study of the Hittite military organization Richard Beal dealt with the title UGULA 1 *LI* ^{LÚ.MES} ŠUŠ at some length (Beal 1992, pp. 375–378). According to Beal, "this title literally means 'Overseer of One thousand Chariot fighters.'" Because in the Old Kingdom of Hatti two such officers seem to have been in place at any given time, Hattushili may have had—at least as an organizational ideal—2000 chariot fighters. Even if we assume four men for each chariot (a driver, an archer, a runner, and possibly a shield bearer) we would still be reckoning with an ideal chariotry of several hundred vehicles. The "Anecdotes Text" is one of the earliest in which an Overseer of One Thousand Chariot fighters is mentioned (Beal 1992, pp. 375–376). At p. 378 Beal says that all attestations of the title "date to around the time of Hattušili I and Muṣili I" and that it was then superseded by another title, borne by a pair of officers who were in charge "of the left" and "of the right." In personal correspondence (June 11, 2013) Beal tells me that he would now extend the first title's usage down to the reign of Telepinu, at the end of the Old Kingdom.
 - 25 Beckman 1995 believes that the text is a "literary" composition, and that—in supplying speeches for Hattushili and his subordinates—it magnifies the Great King by portraying his underlings as incompetent.
 - 26 See Beckman 1995, p. 27:

Numerous Hitticisms betray the native tongue of the author of *CTH* 7, and several portions of the text (rev. 14–15, 17) are indeed in Hittite. It is my view that the present text is a translation of a lost Hittite original, made already in the Old Kingdom, as shown both by the archaic script of the tablet and by a number of Mari-like features of the Akkadian.
 - 27 Reverse, lines 1–9 (translation from Beckman 1995, pp. 26–27). Here Hattushili asks his generals, "How was it? They captured the thirty chariots of the city Huruhhiš which entered into the city Ašihī."
 - 28 Reverse, lines 22–32 (translation from Beckman 1995, pp. 26–27).
 - 29 Drews 1993a, pp. 121–122, with Plate 1.
 - 30 For a translation of the "Anecdotes Text" see Beal 1992, p. 376.
 - 31 Thoroughly studied, with a new translation and commentary, by Houwink ten Cate 1983 and 1984.

- 32 Houwink ten Cate 1984, p. 49.
- 33 Bryce 2005, p. 67.
- 34 Houwink ten Cate 1984, p. 50.
- 35 Houwink ten Cate 1984, p. 66, observed that in earlier times “a number of passages show that the town gate of a walled town used to be selected as the main target of an attack.” In the Hittite Old kingdom, however, “apparently the defenders sometimes preferred a battle in open terrain to a defense of their own city walls.”
- 36 Houwink ten Cate 1984, p. 58.
- 37 The identification of the Manda-troops as “a corps of charioteers” was made forcefully by Houwink ten Cate 1984, p. 56. On the Manda-troops see also Collins 1987, pp. 139–140.
- 38 Bourriau 2000, p. 174, explains the term:

Egyptologists conventionally translate *aamu* as “Asiatics” (that is, inhabitants of Western Asia). The term “Hyksos”, on the other hand, derives, via Greek, from the Egyptian epithet *hekau khasut* “rulers of foreign (lit. ‘mountainous’) countries” and was applied only to the rulers of the Asiatics. In itself it held no pejorative meaning except to denote a lower status than that of the Egyptian king, and was used both by the Egyptians and by the Hyksos kings of themselves.
- 39 See Redford 1997, p. 1: “If the Ancient Egyptian historical record is subject—sometimes more, sometimes less—to the haphazard of preservation, the Hyksos occupation must be the prime example of a period for which happenstance has robbed us almost totally of written material.”
- 40 For translations of the stela see nos. 68 and 69 (pp. 13–15) in Redford 1997.
- 41 Herold 2004, p. 124: “Einzelne Knochen von Pferden wurden immer wieder bei Ausgrabungen in Tell el-Dab’a/Auaris, der Hauptstadt der Hyksos in Ostdelta, in Schichten der frühen Hyksoszeit gefunden (Boessneck u. von den Driesch 1992, 24 f.).”
- 42 In reviewing 50 years of scholarship on the Buhen horse, Raulwing and Clutton-Brock 2009 agree that the dating ca. 1675 BC is correct, and that the horse had been used in paired draft.
- 43 Emery, Smith and Millard 1979, p. 3.
- 44 On the skeleton of the horse see Juliet Clutton-Brock, “The Description,” pp. 191–195 in Emery, Smith and Millard 1979. At p. 192 Clutton-Brock noted the excessive wear on the horse’s lower left first pre-molar (the counterpart on the right was missing) and concluded that the horse “was ridden or driven with a hard bit, that was perhaps of bronze.”
- 45 Redford 1992, p. 236. At note 113 Redford refers to Max Burchardt, *Die altkanaanäischen Fremdworte und Eigennamen im Ägyptischen* (Leipzig, 1909) as still the fullest compilation of words that the Egyptians borrowed from Northwest Semitic.
- 46 Littauer and Crouwel 1988; followed by Drews 2004, pp. 88–89.
- 47 Bar-Oz et al. 2013.
- 48 Moeller and Marouard 2011.
- 49 On the assumption that ca. 1675 BC the *hyksos* had not yet entered Egypt, and that the chariot was not yet used in battle, Raulwing and Clutton-Brock 2009 propose that the Buhen horse may have belonged to a 13th Dynasty officer at the fortress, who had a chariot for his personal use. I will now suggest that the *hyksos* Khayan, ruling Lower Egypt ca. 1675 BC, may have supplied a small chariotry to a 13th Dynasty vassal (possibly Sobekhotep IV, but more likely a successor) in Upper Egypt, and that the Buhen horse was part of that small chariotry. In any case, the horse was apparently killed when Kushites stormed the fortress, which was then abandoned until its rebuilding early in the New Kingdom.

- 50 Stephen Harvey, *The Cults of King Ahmose at Abydos* (University of Pennsylvania dissertation, 1998). On the significance of Harvey's work at Abydos see O'Connor 2009.
- 51 See O'Connor 2009, pp. 108–109: after examining some fifty (out of several thousand) fragments of decorated limestone Harvey concluded that a wall space about 6 m long and 3 m high had two registers. "The lower left depicted Ahmose's royal ship and others sailing 'north', presumably from Thebes to Avaris; the upper left showed a superhuman Ahmose in his chariot riding down Canaanite enemies, with—further left—the siege of a fortified town."
- 52 Victor Hehn, *Kulturpflanzen und Haustiere in ihrem Übergang aus Asien nach Griechenland und Italien, sowie in das übrige Europa: Historisch-linguistische Skizzen* (Berlin: Borntraeger, 1870). An English translation was published in 1885.
- 53 For Meyer's pertinent paragraphs see Raulwing 2000, pp. 60–61.
- 54 Hermes (1872–1942) began her career as a teacher in a girls' school. She went on to write books on educational goals and methods, with a focus on the education of adults and especially of manual laborers. Hermes also promoted her views and values in a novel: *Rote Fahne in Not* ("Red Flag in Distress," 1929). Because of her Marxism, Hermes' books were banned by the Nazis. She then turned to prehistory, in which she had always had an interest, and wrote the three solid and courageous articles cited below.
- 55 Hermes 1935–1936, Hermes 1936, and Hermes 1937.
- 56 Hermes 1936, p. 370. Working with the very high chronology for Hammurabi that was current in her day, Hermes supposed the sacking of Babylon occurred either in 1926 BC or 1850 BC.
- 57 Hermes 1936, pp. 372–373. By following the trail of cheekpieces, Hermes' subsequent (1937) article traced the progress of *Indogermanen* into temperate Europe in the middle of the 2nd millennium BC, first into central Europe and the Po valley and then into northern Germany. Because Hermes had no evidence for chariots in temperate Europe she assumed that the *Indogermanen* who came to temperate Europe in the 2nd millennium BC were riders. See Hermes 1937, pp. 113–116, "Die europäischen Indogermanen als Reitervölker."
- 58 Hermes 1936, pp. 374–375: "Der frühmykenischen Epoche entstammend, charakterisiert er dieses Volk bei seinem Antritt in die Geschichte als ein Kriegervolk, dessen Kriegstechnik auf Pferd und Wagen beruht."
- 59 Hermes 1936, p. 374, note 26.
- 60 Hermes 1937, p. 110: "Überall schmiegen sich die Siedlungsräume des neuen Volkstums an die Metallager des mittleren Europa an."
- 61 Spengler's "Der Streitwagen und seine Bedeutung für den Gang der Geschichte" was a 30-minute lecture, given on February 6, 1934 at a meeting of the Friends of Asiatic Art and Culture in Munich. Spengler died in 1936 and the lecture was published posthumously in *Die Welt als Geschichte* 3 (1937), pp. 280–283.
- 62 Spengler 1937, p. 280: "Keine Waffe ist so weltverwandelnd geworden wie der Streitwagen, auch die Feuerwaffen nicht. Er bildet den Schlüssel zur Weltgeschichte des 2. Jahrtausends v. Chr., das in der gesamten Geschichte die Welt am meisten verändert hat."
- 63 Spengler 1937, p. 282:

Zu dieser Waffe gehört eine neue Art Mensch. Die Freude an Wagnis und Abenteuer, an persönlicher Tapferkeit und ritterlichem Ethos macht sich geltend. Es entstehen Herrenrassen, die den Krieg als Lebensinhalt betrachten und mit Stolz und Verachtung auf Bauernvölker und Viehzüchterstämme herabsehen. Hier, im 2. Jahrtausend, spricht sich ein Menschentum aus, das noch nicht da war. Eine neue Art Seele wird geboren. Von da an gibt es ein bewußtes Heldentum.

64 Spengler 1937, p. 283: “Statt des ägyptischen Beamten- und des babylonischen Priesteradels bildet sich hier ein Waffenadel. Der Krieg ist der Lebensinhalt des herrschenden Standes.”

65 See Fink 2013, p. 292:

Nach diesem Vergleich der Spenglerschen Thesen mit dem aktuellen Forschungsstand kann festgestellt werden, dass Spenglers achtzig Jahre alte Thesen zum Streitwagen heute noch erstaunlich aktuell erscheinen, wenngleich auch die moderne Forschung—zumindest in der von mir durchgesehenen Literatur—keinen Bezug auf Spengler nimmt.

66 On this development see Dawson 2008.

67 Devoto 1962.

68 Bosch-Gimpera 1961.

5 The beginnings of militarism in temperate Europe

In the second quarter of the second millennium BC a military class appeared over much of western Eurasia. In the Near East, the only place for which we have written records for the period, this class was made up of chariot drivers and chariot archers. From the seventeenth century BC to the twelfth, they were the backbone of the Great Kingdoms: Kassite Babylon, New Kingdom Egypt, Mittani, and the Great Kingdom at Hattusha. The minor kingdoms in the region as well as the Mycenaean palaces in Greece and on Crete also equated their chariotries with military strength.

In temperate Europe too charioteers seem to have made their appearance in the period 1750–1500 BC. Indirect evidence for chariots at that time has been found in the Carpathian basin, northern Europe (northern Germany, Denmark and southern Sweden), and in northern Italy. Although large chariotries were maintained by the Mycenaean palaces until the end of the Bronze Age, in temperate Europe the chariot's military usefulness must have been limited and brief. In the second half of the second millennium BC chariots in the Carpathian basin, southern Scandinavia and northern Italy seem to have served as status symbols, while the men who owned them were at the top of a warrior class that fought on foot with swords and spears.

Before and through most of the Bz A2 period the material record from temperate Europe includes no swords and no spearheads. Then, quite suddenly, swords and spearheads make their appearance, and eventually they are there by the thousands. They show up occasionally in settlement deposits, more often in graves, and still more often in hoards and votive deposits. Many of the weapons from Middle and Late Bronze Age Europe come from dedications made either in lakes and lagoons or more often in rivers. Running water, as Daniel Neumann has suggested, was throughout the European Bronze Age the preferred place for making a ritual offering of weapons.¹ And swords, especially those that were skillfully decorated, were the offering of choice. The votive deposits show with special clarity how radically parts of Europe had changed in the Bronze Age, from a society in which battles seem to have been virtually unknown to the belligerence that was to characterize Europe for the next three and a half millennia.

The reality of warfare in Late Bronze Age Europe was illustrated recently by the discovery of a votive deposit made ca. 1200 BC in, or to, the Tartaro river at Pila del Brancon (near Verona).² The deposit lowered into the Tartaro contained

at least ten bronze swords and fifty-one bronze spearheads. The spearheads were blunted. The dedicators treated the swords with respect, keeping them intact but “killing” them by annealing, rapidly quenching, and then U-bending them.³ The swords and spears were evidently the weapons of a defeated force, and although still very serviceable were made into a precious sacrifice that the victors presented to the gods and buried forever in a flowing stream.

Even more recent is the discovery of a battlefield along the Tollense river in northeastern Germany, more than 500 airline miles from Pila del Brancon. In a two-mile stretch along the banks of the Tollense, and in the river bed itself, archaeologists from Mecklenburg have found bronze spearheads and bronze and flint arrowheads. In the small area thus far excavated they have also found the bones of more than 100 men, most of whom were in their twenties or thirties, and of five horses.⁴ This was a battleground, not a burial ground, and their bones lay where the men and horses fell. Carbon dates indicate that the battle was fought ca. 1250 BC. Skulls and bones were cracked by swords, axes and spears, and arrowheads were imbedded in the bones. On the basis of what has been found, and what remains to be dug, the archaeologists suggest that the Tollense battle may have involved several thousand men.

The battles at the Tartaro and the Tollense show how bellicose parts of Europe had become by its Late Bronze Age. But it had not always been so. Chapter 3 pointed out what little evidence there is for any military presence in Europe before the late stage of the Bz A2 period. This chapter will explore the evidence for a radical change toward the end of that period.

The advent of militarism in temperate Europe seems to have been a result of the chariot revolution, and it happened first in the Carpathian basin. The introduction of chariots into warfare obviously had enormous consequences in the Near East. The Shaft Graves at Mycenae and tholos burials elsewhere show that in Greece the advent of chariots coincided with the advent of militarism. In the Carpathian basin we have nothing like the Mycenaean Shaft Graves, but it is becoming clear that two or three generations before the end of the Bz A2 period (the Bz A2 period in central Europe is roughly contemporary with the MH and MM periods in the Aegean) there were innovations here of fundamental importance for military history. Here too the change came with chariots. In 1998 Nikolaus Boroffka published a catalogue and description of the many bone and antler cheekpieces found in Bronze Age Romania, and his meticulous work is essential for the argument of this chapter.⁵ For archaeologists focusing on continuity and evolution, the military innovations may not be of much interest. The decorative motifs on pottery in the Carpathian basin gradually evolve from zigzag to meander and the techniques of incision change slightly, but in many respects the pottery stays the same because that is what pottery does.⁶

Although chariots made their appearance in the Carpathian basin late in the Bz A2 period, along with swords and spears, the archaeological evidence alone does not connect those innovations to conquest or to any other event (no destruction levels in the Carpathian basin are dated to the second half of the Bz A2 period). Events in prehistory by definition remain beyond our ability to describe, but the

archaeological evidence shows clearly enough the militarization of the Carpathian basin late in the Bz A2 period, and not long thereafter of two other parts of temperate Europe that were rich in natural resources. Circumstantial evidence suggests, although it cannot prove, that this militarization represents a takeover of these areas by intruders from the east. It has often been supposed that chariot warfare was “borrowed” by one population from another, in somewhat the same way that styles of pottery or methods of weaving were borrowed. But until it had become widely familiar chariot warfare could hardly have been borrowed without also “borrowing” not only the horses but also the men on whom it depended: grooms, veterinarians, trainers, drivers and archers.

Before plunging into the murk of prehistory, it will be helpful to recall that in historical times the replacement of one language by another has usually been a consequence of military domination. Until the early nineteenth century languages normally survived and evolved within natural topographical boundaries, such as rivers, mountain ranges, deserts, large bodies of water and other physical features.⁷ The remarkable survival of many Basque dialects in the Pyrenees, of various Nuristani dialects in the Hindu Kush, and of several dozen languages in the Caucasus is a result of the isolation of the mountain valleys in which they have been spoken.⁸ The displacement of one language by another, in contrast, has regularly been due to factors other than topography. A hundred years ago it was supposed that in prehistoric times language displacement was typically the result of a national migration, but such an explanation has lost its credibility. In historical times the displacement of one language by another was occasionally the result of inherent advantages of the triumphant language community. The spread of Aramaic in the Fertile Crescent during the first millennium BC, for example, seems to have been largely a consequence of the language’s utility in trading and of the alphabetic script in which it was written. And I have argued in Chapter 1 that Indo-Hittite languages spread across western Anatolia and into southeastern Europe in the agricultural “wave of advance” proposed by Renfrew, Mesolithic Europeans learning the language of their Neolithic neighbors and eventually forgetting their own. The spread of PIE far to the east and far to the west of the Volga apparently continued this wave of advance, with wagons and pastoralism instead of agriculture as its motivating force.

More often, the replacement of one language by another was the result of a military conquest or takeover. Such replacement was never immediate, but came about gradually because the language of the rulers enjoyed a much higher status than that of the subjects.⁹ From the fifteenth century through the eighteenth the Russian language spread as the tsars extended their rule from Muscovy to a Russian empire. Arabic is spoken throughout the Middle East and North Africa because Arabian armies conquered those lands in the seventh century: by the tenth century millions of the caliph’s Jewish and Christian subjects had learned to speak Arabic at least as a second language. The thousand languages spoken in the pre-Columbian Americas have given way to the languages of four European imperial powers: Spain, Portugal, England and France. Several hundred indigenous languages of Australia were likewise replaced by English, as British colonists extended British

rule over the continent. The linguistic map of Europe itself is the result of military conquest. Most Europeans west of the Rhine speak a “Roman” language because the Romans conquered most of Europe west of the Rhine. And the Anglo-Saxons who took over southeastern Britain in the fifth century undoubtedly left their linguistic mark on the island.

This mechanism of language replacement is so familiar that historians can have little difficulty with a theory that the Indo-European languages came to Europe in the wake of military conquests. Much more difficult would be to come up with any other explanation of how and why Indo-European languages came to be adopted through most of Europe. Renfrew’s *Archaeology and Language* was an attempt to substitute an agricultural “wave of advance” for Gimbutas’ riders who Indo-Europeanize Europe as they conquer it. Renfrew’s wave of advance works well enough for the spread of Indo-Hittite into Europe and the spread of PIE along the Asian steppes, but if the Indo-European riders are driven from the field it probably will be by conquerors of another kind.

It is quite clear that in Europe militarism, with chariots, first appeared in the Carpathian basin and in Greece. This happened, on the chronology employed here, shortly before 1600 BC. By ca. 1500 BC a military class with ties to the Carpathian basin had also taken control of southern Scandinavia and of northern Italy. In these latter areas chariots were also present, but probably performed little or no military service. In Europe, unlike the Near East, the actual employment of military strength may have been unnecessary. For those who displayed it, the mere appearance of military strength may have been enough to take over the lands they coveted. I believe that the militarizing of the Carpathian basin and northern Italy was the occasion for their Indo-Europeanization, and I suspect that the militarizing of southern Scandinavia may have launched the Germanic subgroup of Indo-European.

Tin bronze, and some prehistory of temperate Europe

Before exploring the arrival of militarism in the Carpathian basin, I will sketch as best I can—which will obviously leave much to be desired—several aspects of the prehistory of the Carpathian basin, within the broader context of temperate Europe, down to the early second millennium BC. By that time several parts of temperate Europe were profiting from the commencement of tin bronze metallurgy (in this book, as the reader has been warned, the eastern limits of “Europe” are the Gulf of Finland and the eastern arc of the Carpathian mountains). In the new metallurgy tin, very rare in Europe and therefore a semi-precious metal, was intentionally alloyed to copper. The standard ratio is approximately one part tin to ten parts copper, but in the early stages of the new metallurgy the ratio was often closer to 1–20. In the third millennium BC and even the fourth tin bronze had occasionally been produced, but in most of the so-called bronze objects dating before ca. 2200 BC the metal was a mixture of copper and arsenic.¹⁰

Through most of the third millennium BC northern Europe was characterized by the enormous Corded Ware (also known as the *Schnurkeramik*, Battle-Axe,

or Single-Grave) culture. This culture is attested from the Rhine to the confluence of the Oka with the Volga, a distance of more than 2500 km. As noted in Chapter 1, population geneticists have concluded from their DNA studies that in this vast area people tended to move from the east to the west, and it may well be that an Indo-European language (Proto-Baltic) was brought not only to what are now the Baltic states and northern Poland, but also to northeastern Germany and Denmark. In parts of central and in westernmost Europe, as well as in Britain and eastern Ireland, the relevant archaeological culture was the Bell Beaker. This Beaker culture had begun well after 3000 BC, perhaps in Portugal, had spread over the Iberian peninsula and along the Atlantic coast of France up to Britain and Ireland, and after ca. 2500 BC from the Low Countries into southern Germany and central Europe. Although people in both the Beaker and the Corded Ware cultures made some use of copper, their tools and weapons were most often stone, and the cultures as a whole were Neolithic.

Toward the end of the third millennium BC the central European region of the Beaker culture entered the Bronze Age. In central Europe the Early Bronze Age is usually divided between Bz A1 and Bz A2. Most archaeologists and students of European prehistory date the Bz A1 period to ca. 2200–1950 BC, and Bz A2 to ca. 1950–1600 BC. Because I am following the historical chronology rather than a chronology based on carbon dates, I will date the Bz A2 period to ca. 1850–1500 BC. Information about temperate Europe in its Early Bronze Age tends to come from graves, but a few settlements have been found.¹¹ Typically these were villages of 100 or a few hundred people and most of the families in a village were evidently subsistence farmers, dependent upon the outlying fields and pastures. In many villages could also be found a potter, a weaver, a carpenter, and perhaps an itinerant smith and a few other specialists. The settlement was hardly fortified, although it might be surrounded by a ditch or a palisade, discouraging human intruders but perhaps meant especially to keep out predatory animals. So far as can be determined from pits and post-holes, houses were small. In some areas villagers lived in oval or round huts, 4 or 5 m in diameter, and where timber was plentiful rectangular log houses seem to have been the norm.

The first phase of the Early Bronze Age in central Europe has traditionally been called the Únětice or Aunjetitz archaeological culture, named after a type-site near Prague. In 1879 Čeněk Rýzner, a physician and an amateur archaeologist, excavated a cemetery at Únětice and found that the grave goods included many fine artifacts made from tin bronze. Similar cemeteries were subsequently found in southeastern Germany, Slovakia and southwestern Poland.¹²

The mining of copper and the making of bronze artifacts were fundamental for the sometimes surprising wealth of the Únětice cultural region. Initially the Únětice smelters turned out arsenical bronze. The Erzgebirge (“ore mountains”) contained significant tin deposits, however, and the smelters soon learned to alloy copper with tin from cassiterite nuggets panned from streams flowing down the Erzgebirge. The most spectacular burials—in large underground chambers—of the Únětice culture were found at Leubingen and Helmsdorf, in Thuringia. The burials date to the early second millennium BC.¹³ In 2011 Mario Küssner and his

archaeological rescue team found a much humbler cemetery at Dermsdorf, not far from Leubingen, and also a long and large (ca. 440 square meters) building that quite clearly was much more than a house.¹⁴ Alongside the building were the remains of a large clay pot in which more than 100 bronze axe-heads had been placed, probably as a sacrifice or votive offering. These axe-heads were flanged rather than shaft-holed, each weighing approximately 250 g and meant for insertion into a haft for a hatchet. The Dermsdorf structure and cemetery apparently date toward the middle of the Bz A2 period.¹⁵

Enthusiasm for bronze also brought great changes along the southern slopes of the Alps. The Early Bronze Age in northern Italy began quite abruptly with the Polada culture, which seems to have extended through the Lombardia, Trentino and Veneto regions.¹⁶ Although the area had been inhabited all through the Neolithic period, its population seems to have increased significantly during the early stages of the Early Bronze Age. For the beginning of the Polada sites of Lavagnone and Luccone, near Lago di Garda, dendrochronology provides dates from 2077 to 1992 BC.¹⁷ The Polada culture continued to flourish throughout the first half of the second millennium BC, and it must have contributed greatly to the rise of the Terremare culture in the Po valley. The Terremare communities, like those of the Polada culture, were very much involved in bronze metallurgy. Many stone molds were found in excavations of the Terremare settlements, the molds having been used for the casting of weapons, tools and ornaments.¹⁸

Although many bronze artifacts have been found at Polada and Terremare sites, mines of the period in the central and eastern Alps have not yet been identified. On the southern slopes of the western Alps we have the opposite picture.¹⁹ It is now clear that the intensive mining of copper began there not long after it began in the Erzgebirge, but it is not at all clear where the copper was going. In the Saint-Véran area, on the French side of the French-Italian border, an ancient mine and three smelting sites have been found at high altitudes.²⁰ Carbon dates from both the mine and the smelting sites (all of which lie more than 2200 m asl) show that the mine began to be worked shortly before 2000 BC.²¹ David Bourgarit and his colleagues, who excavated the sites, estimate that the ancient miners and smelters at Saint-Véran produced approximately 7 tons of copper per year, which if correct would justify the investigators' conclusion that "mass production" of copper began here late in the third millennium BC. Bourgarit and his colleagues, however, noting that few artifacts of copper or bronze dating to this period have been found in the region, call attention to "the mis-match between the huge estimated Early Bronze Age ore extraction and the small scale of the subsequent metallurgy-related activities and products. In other words, the destination of the Early Bronze Age production is unknown."²²

Beginnings of a vigorous bronze metallurgy also brought a measure of prosperity to the western fringe of the Beaker culture not long after 2000 BC. The areas most affected at this time were southwestern Britain, Brittany (on the European continent opposite Cornwall) and northern Portugal. These three lands had large and accessible tin deposits, surpassing those of Bohemia. In Britain the new prosperity expressed itself in the Wessex culture, just to the east of Cornwall, while

in Brittany the tin deposits made possible the dimmer splendor of the Armorican Bronze Age. Enthusiasm about metallurgy also brought the Bronze Age to Ireland, where the mining of copper in southwestern Ireland (counties Kerry and Cork) began ca. 2000 BC.

In both the Únětice zone of central Europe and in Wessex and Brittany “princely” or “chiefly” burials suggest the formation of chiefdoms early in the second millennium BC.²³ A few tumuli or kurgans, as at Melrand in Brittany or at Leubingen in central Europe, exceeded 2000 cubic meters in volume, and the rich burial chambers contained silver and gold objects along with several bronze daggers and axe-heads. Graves of high-ranking women included amber beads and jewelry of precious metal. When a chief was buried animals were sacrificed at the grave and their meat provided a feast for the mourners. Other animals were ritually slain and were placed in the burial chamber, so that they might accompany the chief to the Underworld. Humans might also be selected for this horrendous honor. At Leubingen a few bones indicated that a young girl had been ritually slain and her body placed across that of the chief.

While some regions of temperate Europe were prospering early in the second millennium BC, in other regions Europeans were just emerging from their Neolithic past or still in it. Vaguely in the Corded Ware zone of Europe, and not yet in the Bronze Age, were the coastal areas around the Baltic and the North Sea. In what is now southern Scandinavia the only natural resource that was valued in the early second millennium BC was amber. Washed ashore from the ocean, amber was collected on the beaches of southwestern Sweden and Jutland, as well as on the Baltic coast from Poland to Estonia. Amber, however, was not a novelty: it had been prized for its beauty ever since the Paleolithic period, and since at least 2500 BC had been a commodity for exchange.²⁴ Although the lands along the Baltic and North Sea had apparently attracted a steady flow of immigrants from the east, probably speaking a Proto-Baltic language, the lands were laggard in experiencing the changes that occurred earlier in the stanniferous regions of Europe or in the Po valley. In the Nordic countries the Bronze Age did not begin until ca. 1500 BC (Montelius I).²⁵ As summarized by Andrew Sherratt,

Scandinavia—and especially Denmark, with its relatively large and dense population—lived in a retarded Stone Age, exporting amber and importing both Irish axes and Únětice daggers, but without metal sources in its own sphere and without an indigenous industry for reprocessing imported metal on any scale.²⁶

Another laggard part of temperate Europe was the Hungarian plain, Transylvania and the land on both banks of the lower Danube. In the fifth millennium BC the fertile lands along the middle and lower Danube and its tributaries had been thickly settled, and some of the richest Neolithic burials ever found were excavated at Varna on the Bulgarian coast. The gold in these “princely” graves points to a ranked society. The Neolithic and Chalcolithic type-sites of Gumelnița on the Romanian bank of the lower Danube and Karanovo (VI) in central Bulgaria were at the heart

of what Marija Gimbutas called “Old Europe.” Toward the east, this archaeological assemblage was contemporary with, and connected to, the Cucuteni-Trypillian culture, named after two of the earliest type-sites, one in northeastern Romania and the other in Ukraine. Villages of the “Old Europe” type were to be found as far west as central Austria. The prosperity of “Old Europe” depended mostly on its good soils and abundant rainfall and therefore its suitability for agriculture, but in Transylvania also on the extraction of copper and the panning of gold from the Carpathian mountains.

Between ca. 4000 and 3700 BC “Old Europe” declined significantly, for reasons that are unclear, and it remained at a low level for a very long time. Fewer settlements in this area are known from the later fourth millennium BC, and those that have been identified are very small. It may be, as Andrew Sherratt suggested, that the readily accessible sources of Carpathian copper were by that time depleted.²⁷ In the third millennium BC livestock evidently became more important in the economy of Transylvania and eastern Hungary, with agriculture playing a subordinate role. Many low passes lead through the Carpathians and it is possible that some of the inhabitants of Transylvania and Hungary in the third millennium BC were nomadic pastoralists from the Eurasian steppe. Much remains unclear, however, about the prehistory of Romania and Bulgaria in the third and early second millennium BC, in part because little archaeological research was done in these states until the 1990s.

Given the presence of copper in the Carpathians, it is surprising that Transylvania and other parts of Romania seem to have continued at the Neolithic level until after 2000 BC.²⁸ Most of what is known of Transylvania during the third millennium BC is labeled as the Coțofeni archaeological culture,²⁹ and most of what survives is clay: either incised pottery or crude figurines. The inhabitants lived in small huts or in pit-dwellings. In the latter, which had also been common in the Early Neolithic period, posts at the corners of the pit supported a roof, but all of the small living space was subterranean. Cattle, pigs, goats and sheep were common food animals (horses were evidently rare).³⁰ There was nothing prosperous about these communities. Eventually the Coțofeni “settlements” of Transylvania seem to have been abandoned, and what followed has been assigned to the Glina, the Schneckenberg, and a welter of other archaeological cultures, most of them poorly known and none of them securely dated. From the end of the third and beginning of the second millennium BC few settlements have been found, and those few tend to be near copper deposits. Presumably the people who lived in the settlements spent much of their lives mining copper, but they profited little from their industry. Most information comes from graves, some of them tumuli, and the grave goods deposited in the tumuli are not impressive. The dead went to the Underworld with some pottery, usually undecorated, but with no metal other than a very rare piece of personal adornment.³¹

On the Hungarian plain, as in Transylvania, stood many kurgans. Their dates are problematic, but some of the kurgans seem to have been erected in the centuries just before and after 2000 BC. Although the dead buried in these kurgans

may have been nomadic pastoralists who had come from the Pontic steppe, the grave goods have few significant parallels on the steppe.³² In both Transylvania and Hungary the many archaeological cultures were not only similar to each other but also were not much different from what has been found to the south (through the Balkans, as far as what later would be Thessaly, Macedon and Thrace) and to the east (at Alishar Hüyük in central Anatolia and even in Transcaucasia).³³ John Younger has observed that until the end of EH II the stone and clay seal-stamps used in the Aegean world were local versions of a widespread *koine*, reaching from central Anatolia to Hungary.³⁴ Perhaps a still wider *koine* could have been observed at the beginning of the second millennium BC.

More impressive than anything in Transylvania and Hungary were “tell-settlements” that early in the second millennium BC began to appear along the western Carpathians, especially where copper and other mineral deposits were located, or along trade routes. As tells, they were occupied continuously for many generations and by the Bz A2 period a few of them were very large villages, perhaps with close to 1000 people. Examples are the Slovakian sites of Spišský Štvrtok, which commands a pass through the Carpathians, and Fidvár, one of several settlements along the southern slopes of the western Carpathians. Also illustrative is the similarly named Feudvar in northeastern Serbia: the Bronze Age community at Feudvar lay on the right bank of the Tisza river shortly before it flows into the Danube. It was a planned community, and a center for the working of tin bronze.³⁵ These and other sites were “fortified” by ditches and ramparts, possibly supplemented at Spišský Štvrtok by a stone wall. Although the tell-settlements continued to flourish through most of the Bz A2 period, by the end of that period they were shrinking and in the Bz B period (the Tumulus culture) most of them had been either destroyed or abandoned. At Fidvár in Slovakia a settlement covering eleven hectares in the Hatvan-Únětice period scarcely covered a single hectare at the end of the Bz A2 period.³⁶

The Otomani-Füzesabony archaeological culture

In Transylvania, western Romania and eastern Hungary material conditions began to improve ca. 1800 BC, and the area undoubtedly became more attractive. The improvement was quite certainly tied to the beginning of a bronze industry. When survivors prepared a body for the grave they could now afford a bronze pin with which to fix the clothes or the shroud around the deceased, and the corpse might also wear a bronze ring on a finger or a bronze pendant around the neck.³⁷ The pottery placed in the grave also tended to be more interesting than it had been: the pots are now regularly decorated, usually with a simple zigzag incision. These and other improvements are labeled the beginning of the Otomani-Füzesabony archaeological culture,³⁸ named after one type-site in western Romania and another in eastern Hungary. What had begun with the Únětice culture in the Erzgebirge, 500 miles to the northwest and 300 years earlier, was finally—early in the second millennium BC—reaching western Romania, although here was nothing so spectacular as the chiefly burials found near the Erzgebirge.

Approximately half way through the Otomani-Füzesabony period, what Kristian Kristiansen and Thomas Larsson call “highly developed Bronze Age societies” began to appear in Transylvania and elsewhere in the Carpathian basin:

Their expansion corresponds to a qualitative and quantitative leap in metal production centered in the Carpathians, beginning around 1750/1700 BC. This represents an indigenous production of metalwork of high standard. A whole series of new weapon and ornament types were introduced—long swords, lances, battle-axes, arm rings, ankle rings, pendants, etc., together with new casting technologies and a new stable tin alloying. . . . Large-scale metal production of a scale and quality hitherto unknown in central Europe had emerged. A stratified settlement system with fortified central settlements for production and distribution allowed an organised and widespread distribution of this new metal industry, mainly prestige goods, weapons and ornaments.³⁹

This intensification of metal production, the commencement of which I must date ca. 1650/1600 rather than a century earlier, continued through much of the third quarter of the second millennium BC, as more bronze seems to have been produced in the Carpathian basin (and especially in Transylvania) than anywhere else in Europe. In addition to accidental discoveries of hoards of bronze (and gold) artifacts throughout the basin, archaeological excavations have revealed details about the mining and working of metals in Bronze Age Transylvania. Most recently, eight seasons of digging at Pălatca and Bolduț in northwest Romania have unearthed Late Bronze Age smelting furnaces and slag from copper ore, a workshop with an anvil and an oxhide bronze ingot, a variety of clay molds in which the molten bronze was cast into tools, weapons and ornaments, and possibly even a religious structure with an altar for rituals that accompanied the whole process of metallurgy.⁴⁰

Militarizing of the Carpathian basin: introduction

The vigorous exploitation of the Carpathian and Apuseni metals—gold, and abundant new sources of copper—was accompanied by the appearance of luxury goods and of a great number of objects decorated with spiral and curvilinear or *Wellenband* (“wave band”) designs. Of more historical importance were the new weapons mentioned by Kristiansen and Larsson: the weapons, along with the sudden appearance of horse harness, indicate the presence of a new military class.

That such a class was to be found in the Carpathian basin in the second half of the Bz A2 period is far from a new idea. Quite to the contrary, it is generally assumed by specialists on the archaeology of the area. Klára Fischl and her colleagues, commenting on the many deposits of weapons and gold that have been found in Transylvania and eastern Hungary, go on to speculate about the significance of the deposits:

The weapons are usually richly decorated with engraved spiral and geometric motifs, which we may interpret as the increased material and symbolic elaboration of a warrior elite identity. Some of the weapon hoards contain only one or two items, which may represent the weapons set of a leading warrior, while others contain numerous weapons. These may be connected to rituals involving groups of warriors.⁴¹

Laura Dietrich, studying the Bz A2–Bz B elite in the southeastern part of the Carpathian basin, noted its preference for hilltop settlements, at least partially fortified, and saw in both the design of the settlements and the characteristics of the weaponry close connections with the military class in Greece.⁴² In still another recent study, focusing on the weaponry and on the cheekpieces for bits, Carola Metzner-Nebelsick parallels the *Kriegereliten* of the Carpathian basin and of Greece in the Shaft Grave period.⁴³ Although specialists are well aware of the plentiful evidence for the militarizing of the Carpathian basin, the topic is crucial for the argument of this book and so warrants a presentation here in some detail.

The arrival of tamed horses in the Carpathian basin

In recent years much has been learned about Bronze Age chariots, especially in temperate Europe and the steppe. The chariot burials at Sintashta and elsewhere in the southern Urals and along the upper Volga have been well publicized. The carbon dates that David Anthony obtained for the Krivoe Ozero chariot burial place sit shortly before 2000 BC. The early dates, although slightly lowered, have been essentially confirmed by Pavel Kuznetsov, who sampled eleven chariot burials at four sites in the Urals–Volga region: kurgans at Krivoe Ozero and at Utyovka (near Samara, on the middle Volga) and two cemeteries at Sintashta.⁴⁴ The same type of cheekpieces—*Scheibenknebel*, or studded bone disks—found at Sintashta, and also in Shaft Grave IV at Mycenae, have also been found in an elite grave in Tajikistan, tentatively assigned to the BMAC culture.⁴⁵

Most importantly for purposes of the present book, we are now in a position to see that in the second half of the Bz A2 period chariots arrived in the Carpathian basin and especially in the piedmonts of the Apuseni range and of the western Carpathians. This would have been at about the same time, late Middle Helladic, that chariots and militarism came to Greece: on the historical chronology not long before 1600 BC (and on the carbon chronology ca. 1700 BC). Although neither chariots nor representations of chariots survive from that period in the Carpathian basin, evidence comes from the cheekpieces of bits. Much of what is known about these artifacts we owe to Hans-Georg Hüttel, who catalogued all known Bronze Age cheekpieces and bits from the western steppe and eastern and central Europe.⁴⁶ His catalogue remains an essential resource for understanding the arrival of “tamed horses” in temperate Europe.

Domestic horses had been kept here and there in the Carpathian basin at least since 2500 BC and possibly since 3000 BC but they were food animals (and probably

also pressed into service as pack animals).⁴⁷ The “taming” or controlling of horses and the exploitation of their speed as draft animals was not possible until the invention of the bit. In an important article that appeared the year after his catalogue, Hüttel made a very good case that the cheekpieces were evidence of a “chariot age” in the Danubian lands, as they were in Greece, and he regretted that this *Streitwagenalter* was generally ignored in scholarship on the Carpathian basin. It is hard to overstate the importance, Hüttel observed, of what the chariots meant both for the Carpathian basin and for Greece. In both places a military elite made its sudden appearance, whose members drove the chariots or fought from them, carried rapiers, and took possession of *akropoleis* for themselves and their dependents.⁴⁸ In a later study Hüttel stressed the synchrony between the appearance of the tamed horse and of new weapons (spears and swords) in the Danubian lands.⁴⁹ I will add that this would not have been a matter of borrowing, of influence, or of an indigenous development. Chariotry and militarism arrived together—in a complex package—in a land in which both were alien, and they came from a land in which they were not.

The “chariot age” of the Carpathian basin to which Hüttel pointed a generation ago is still ignored, and that is hardly surprising. In the Aegean we have a multitude of chariot depictions: in stone reliefs, in frescoes, on an array of clay tablets, and on more than 100 “chariot kraters.” This voluminous Aegean evidence has now been conveniently gathered together by Marian Feldman and Caroline Sauvage.⁵⁰ The Danubian lands, in contrast, provide no textual evidence at all, for chariots or anything else, and almost no representational evidence. The only pictorial evidence for chariots in the Carpathian basin during the Bronze Age comes from a single cremation urn found in Slovakia. On the neck register of this urn, dating from the *Mittelbronzezeit* (Bz B or C period), are crude depictions of horses pulling driverless chariots.⁵¹ A few clay models of spoked wheels have been found, and a very few clay models of chariots, the most famous being from Dupljaja in eastern Serbia: a chariot drawn by ducks or other waterfowl, made well after the Bz A2 period.⁵² The evidence for a “chariot age” in the Carpathian basin thus depends almost entirely on the cheekpieces catalogued by Hüttel and Boroffka, but the cheekpieces are enough to tell the story.

All of the cheekpieces from central Europe in the Bz A2 through the Bz C period are organic (the earliest metal bits in temperate Europe date from the thirteenth century BC).⁵³ Made from antler or bone, the cheekpieces have survived while the mouthpieces—made of leather, cord, or some other perishable material—have not. Most of the cheekpieces from the Carpathian basin and the rest of temperate Europe are of two types. The older of the two was the *Scheibenknebel*: a bone disk, enhanced with three or four sharpened studs on the inner face.⁵⁴ As indicated in Chapter 2, these disks were used in the southern Urals already ca. 2000 BC. Hüttel counted twenty-three of these: most from the steppes, but a few from the Carpathian basin and from Greece. Now that the purpose of these bone disks has been clarified many more have been identified: a more recent survey of these studded *Scheibenknebel* (the word can be both singular and plural) from the steppes counted more than seventy.⁵⁵

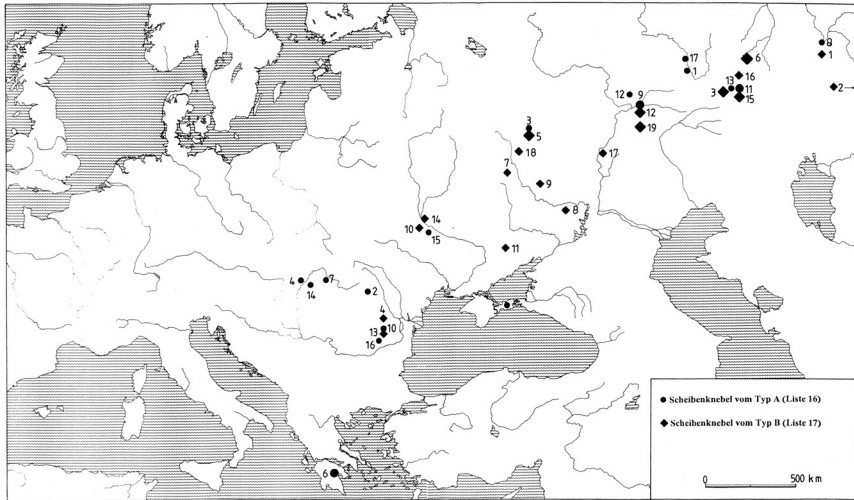


Figure 5.1 Find-spots of disk cheekpieces (Boroffka's Type A and Type B *Scheibenknebel*). From Boroffka 1998, Abb. 17. Courtesy Nikolaus Boroffka and the Deutsches Archäologisches Institut, Eurasien-Abteilung

Carving the studs was arduous, however, and although the earliest cheekpieces in the Carpathian basin were *Scheibenknebel* they soon gave way there to the *Stangenknebel*: the tip of a deer's antler, which was by nature very sharp and in fact too sharp (the tip was often cut off, to avoid injuring the horse). When tugged against the horse's cheek, the lever action on the antler caused the horse to turn its neck and so to turn in the direction of the tug. These *Stangenknebel* were relatively easy to produce, although labor and skill were required for the incised decorations that most of them bore. In temperate Europe the *Scheibenknebel* had gone entirely out of favor by 1500 BC, and for the next 300 years the standard cheekpiece for horse harness was the *Stangenknebel*. Although Hüttel identified 135 of these (nos. 35 through 169 in his catalogue) this kind of cheekpiece was rarely used in the steppes: Hüttel found only a single *Stangenknebel* in the steppes (Anatolia, in contrast, yielded thirteen).⁵⁶ In Europe a sprinkling of *Stangenknebel* has been found in western Hungary and eastern Austria, and then a relatively thick concentration in northern Italy.⁵⁷

The Italian cheekpieces seem to be somewhat later than those from the Carpathian basin, however, and most of the *Stangenknebel* from the Bz A2 period come from western Romania and eastern Hungary.⁵⁸ Hüttel reasonably concluded that the type originated there, and his conclusion has been strengthened by Nikolaus Boroffka's catalogue of all the organic cheekpieces found in Romania. Boroffka counted thirty-one cheekpieces there, eight of them *Scheibenknebel* and the other twenty-three *Stangenknebel*. Eight of the latter, nicely decorated, came from a domestic workshop that archaeologists late in the nineteenth century excavated

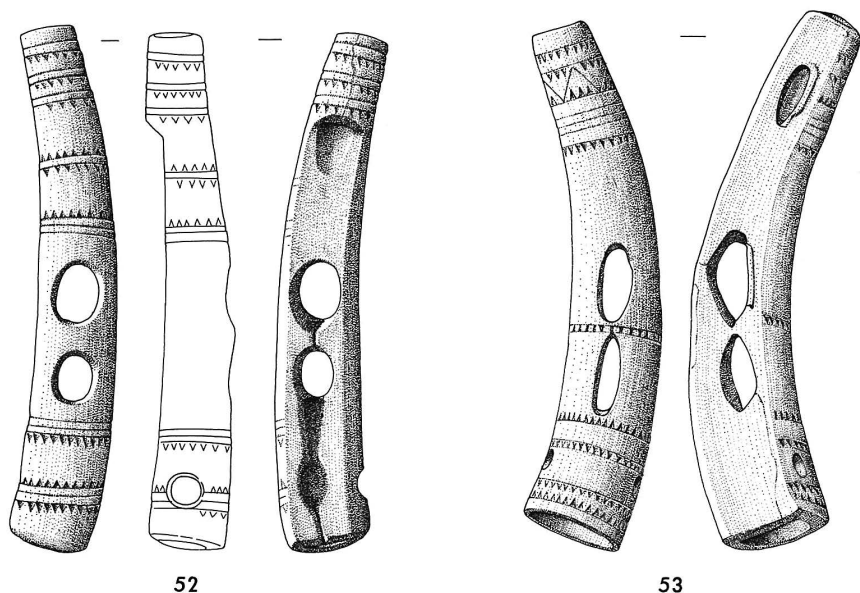


Figure 5.2 Antler cheekpieces (*Stangenknebel*) from the Hungarian plain. From Hüttel 1981, Tafel 6, nos. 52 and 53. Courtesy of C. H. Beck Verlag and the *Prähistorische Bronzefunde* series

at Cetea, a village near the city of Aiud in western Transylvania. The workshop evidently specialized in making *Stangenknebel*, and the archaeologists found in it two dozen antler tips at various stages of preparation. In addition to the eight finished *Stangenknebel* from the workshop, another sixteen antler tips from the same shop were undecorated and mostly unbored. After having been kept for more than a century in the Aiud museum, all twenty-four have finally been described and published by Boroffka (the sixteen unfinished pieces are not included in his catalogue of thirty-one cheekpieces from the Romanian Bronze Age). The Cetea workshop was producing its cheekpieces in the Bz A2 period.⁵⁹

Although many of the cheekpieces from the Carpathian basin cannot be dated, some came from secure contexts. The earliest were placed by Hüttel toward the end of the *Frühbronzezeit*, which is to say toward the end of the Bz A2 period.⁶⁰ Boroffka agreed that cheekpieces—both *Scheibenknebel* and three varieties of *Stangenknebel*—first appeared in the Carpathian basin during the Bz A2 period, although not necessarily toward its end.⁶¹ Boroffka dates the earliest of them closer to the beginning than to the end of that period, and no later than the nineteenth century BC.⁶² So early a date depends on the similarities between the *Scheibenknebel* found in the Danubian lands and those found at Sintashta and elsewhere in the southern Urals. Although the latter apparently belong in the nineteenth if not the twentieth century BC, the type continued to be produced for a long time. From the dozen that have been found in Mycenaean Greece it appears

that at least a few *Scheibenknebel* remained in use there until the destruction that ended the LH IIIB period. Perhaps it is safest to say, until more evidence turns up, that cheekpieces and chariots from the east seem to have come to the Carpathian basin in the second half of the Bz A2 period, and that by the end of that period, ca. 1500 BC, *Scheibenknebel* were being replaced in the basin by *Stangenknebel*.

Here I must briefly confront a thesis, launched by Gertrud Hermes, that late in the Bz A2 period Indo-Europeans on horseback conquered the Carpathian basin.⁶³ Almost 60 years after Hermes' article appeared, Hüttel revived parts of the thesis. Although seeing the riders not as conquerors but as natives of the basin, and not worrying about their language, he strongly endorsed Hermes' proposal that armed riding began in the Carpathian basin in the Early Bronze Age. Hüttel argued that the antler tine cheekpieces of the Carpathian basin were evidence for riders rather than for chariots. A few chariots were to be seen in the basin in the Bz A2 period, he believed, the draft horses being controlled by *Scheibenknebel*. The chariots belonged to an elite, however, while the average man rode into battle on horseback. It was then and there, Hüttel argued, that "the militarizing of riding" began, and from the Carpathian basin it eventually spread to the steppes.⁶⁴

We may assume that in the Carpathian basin (as in many other places) horses were ridden occasionally, and not very impressively, during the Bz A2 period. That the area was dominated by armed riders at that time, however, is not credible. Like Hermes, Hüttel based his thesis on the complete absence of metal bits in the Danubian lands before the thirteenth century BC and the prevalence of *Stangenknebel*, which he thought were not severe enough to control a horse in a chariot battle: only a metal bit could keep a draft horse under control in the heat of battle, while riders could easily control their mounts with organic bits. Hüttel of course was writing when the Dereivka "evidence" seemed to show that on the steppe good riding was already common ca. 4000 BC, and that the riders were controlling their mounts with antler tine *Stangenknebel*.⁶⁵ As I have argued elsewhere in detail, in the second millennium BC riders were far less secure (sitting above the horse's loins rather than up near the withers) than were drivers. Now we can add that during much of the Bronze Age battles of any kind seem to have been rare in the Carpathian basin, and if on occasion a chariot driver did take part in a battle there he should have had as much control with *Stangenknebel* as did the Hittite charioteers of the Late Bronze Age. I am quite certain that armed riding was of no significance until after 1000 BC, and that riders did not become militarily dominant until close to the end of the eighth century BC. All but a very few of the tamed horses that came into the Carpathian basin late in the seventeenth century BC must have been hitched to chariots.

Although they signaled the commencement of militarism in the Carpathian basin, chariots were never so important in temperate Europe as they were in the Near East or in the Aegean. Not surprisingly, we have no pictorial evidence for chariot warfare in temperate Europe at any time in the Bronze Age. When chariots in Scandinavia are depicted in rock carvings they seem to be parade or recreational vehicles, carrying only a driver.⁶⁶ More importantly, a burial that included a chariot

and a team of horses has yet to be found in Bronze Age temperate Europe. Also pertinent is that in the late Bz A2 period and what followed in central Europe, Scandinavia and northern Italy, bows and arrows were less important than swords, spears and axes. It is therefore likely that soon after its arrival in the Carpathian basin the chariot became more of a status symbol than a military necessity. The reason, I believe, was that the inhabitants of the basin had no knowledge of war. They had never seen an army, and had established no states for a chariotry to conquer. Instead, there were villages, some of them large and on elevated sites, but all of them unprepared for battle and even without weapons designed specifically to kill men. It is quite possible that a small force from the east that was bent on conquest—100 chariots on which rode archers carrying composite bows, and a few hundred men on the ground with spears and leather shields—would have been sufficient to take control of a metal-rich sector of the Carpathians or the Apuseni range. Although the chariot would have given the aggressors the confidence to set out on their expedition, on arrival at their destination they would have discovered that chariots would seldom be needed to maintain their control and to extend it in a society unfamiliar with combat.

What has recently been articulated as the military doctrine of “shock and awe” seems to have been applied for the first time in the Early Bronze Age of temperate Europe. The armed and organized intruders would not have intended to kill the men of the villages or to capture their women and their livestock, but only to establish a vague “control” over the villages and over the mining and refining of metals. In return for this novel control, the intruders offered an equally novel offensive capacity: against wolves, bears, wild boars and the occasional lion, first of all, but also against any conceivable human enemy. They also offered connections to a much wider world and access to exotic and beautiful things. The conquest of western Transylvania may have been a bloodless affair, as the very appearance of impressive military gear may have persuaded the indigenous population to submit. To the northwest of Transylvania, along the Carpathians in Slovakia and the Czech Republic, an elite may already have been in control, and when the intruders ventured that far they must have encountered some resistance. There too, however, because offensive weapons were not yet in use (even the “princely” burials at Leubingen and Helmsdorf contained no weapons more formidable than daggers and hatchets) and the concept of conquest was unfamiliar, resistance may have been slight and brief. That the charioteers took over the tell-settlements (evidently encouraging a gradual exodus of the natives) is fairly clear: most of the cheekpieces were found in destruction (or abandonment) levels of the tells, where the rulers evidently lived.⁶⁷

Swords in the Carpathian basin

The most obvious sign that militarism and a ranked society came to the Carpathian basin along with chariots is the sudden appearance of swords, which from the beginning were prestige weapons meant for display. Not a single sword has been found in this region in Chalcolithic or Bz A1 contexts, but the Bz A2 period saw

the dramatic beginning of swordsmanship, a tradition that was to last for well over three millennia. In his catalogue, *Die Schwerter in Rumänien*, Tiberiu Bader identified 470 bronze swords or fragments of swords from Romania. He also included (no. 20) the broken but spectacular gold sword found in a hoard at Perşinari. Of the bronze swords, 331 came from hoards, each hoard usually containing a few swords but several containing a great many. Greatest of all was a Halstatt hoard found at Uioara de Sus (in western Transylvania, not far from the eastern slopes of the Apuseni range), in which were seventy swords. Another seventy-seven swords were single finds, many of them turned up by farmers or diggers. Only a few swords have been found in rivers or streams (these are likely to have been votive deposits), and even fewer come from graves.⁶⁸

The very first of the Romanian swords are Type A rapiers almost identical to those that Schliemann found in Grave Circle A at Mycenae. One Romanian specimen with the shoulder of the blade still visible (no. 11 in Bader's catalogue) had three rivets, and so is closer to the Aegean rapier than to the single-riveted and somewhat earlier rapiers in southern Caucasia. Bader identified eleven Type A rapiers from Romania, all but one of them being single finds and so suggesting that for at least a short time the type was fairly widespread in Transylvania and western Romania.⁶⁹ Because of its place in the typological evolution of swords it is quite certain that the Type A arrived in Romania late in the Bz A2 period, but further precision is not possible. The archaeological contexts of these Type A rapiers are not known, and dating them depends mostly on comparison with the more securely dated Aegean specimens. Bader concluded that the Carpathian rapiers are "somewhat later" than those from the Shaft Graves.⁷⁰ Analyses of their manufacture indicated to Bader that the rapiers were not made in the Carpathian basin, but were imported. Unless evidence to the contrary is found, I think we can tentatively conclude that swords were probably not carried by the military men when first they came to the Carpathian basin, but were soon brought in from Mycenaean Greece.

Just as significant as the arrival of the Type A in Romania is the sword's rapid evolution there. The Type A rapier, as described in Chapter Three, was often close to 100 cm long (and sometimes a prodigious 110 cm long), was poorly hilted, and was surely meant more for display than for combat. A few rivets attached the bronze blade to an organic hilt. Although hilts were made of bone, horn, or even ivory, most often they were of well-polished wood.⁷¹ Here it may be useful to explore more generally the hilt of swords. Unlike the wooden shaft of a spear, easily graspable, a long metal blade presented problems of grasping and gripping. Organic hilts were well suited for gripping, but the attachment of an organic hilt to a metal blade was quite insecure. On some swords (the Type A rapier) it depended on a few rivets and on a short tang that protruded a few centimeters from the blade into the hilt. Weapons so hilted could seem serviceable for thrusting, but not for slashing, because the force of a vigorous slash would break the blade from the hilt. Another unsatisfactory hilt was the *Griffplatt*. Here the top of the blade swelled and flattened out into a thin and circular "grip plate," through which four or six rivets were driven in order to attach it to an organic

hilt. On many of the *Griffplattenschwerter* that have been found the rivet holes are torn through, a clear sign that the hilts of these swords had come loose from the blades. A much more secure hilding characterized the all-metal sword, which in German is called a *Vollgriffsschwert*. The earliest of these were cast as a single piece, blade and hilt coming from the same mold. Later and more popular versions featured a blade with a stout tang, over which a thin (and separately cast) bronze hilt was fitted. Although a *Vollgriffsschwert* was securely hilted, it had a disadvantage. Without a glove, grasping a bronze hilt could be painful, especially in very hot or very cold temperatures. That problem was finally solved by the *Griffzungenschwert*. This sword was cast with two metal "tongues," or flanges, extending all the way to the pommel. Organic plates were then inserted into the flanges, so that the palm of the hand did not come into contact with the metal. The result was a hilt that was not only very sturdy but also easy to grasp.

In the Carpathian basin the fragility of the Type A rapier and the *Griffplattenschwert* gave rise, evidently within one or two generations, to the *Apa Vollgriffsschwert*. This was a well-hilted short sword, capable of slashing as well as stabbing. The Apa, or more fully the Apa- Hajdúsámson, is named for two villages near the northern end of the Romanian-Hungarian border. On the Romanian side, at Apa, a hoard of bronze objects included two of these swords, and in 1907 a third was found in a hoard at Hajdúsámson, on the Hungarian side of the border.

The Hajdúsámson hoard was certainly a votive deposit: carefully placed across the sword were twelve bronze axes. The date of both hoards has usually been put ca. 1600 BC or earlier, and still within the Bz A2 period, but Wolfgang David has argued for a slightly lower date: early in Bz B1.⁷² In the chronology followed here, the hoards date ca. 1500 BC. Apa swords come from twelve find-spots in Romania and Hungary. Bader concluded that the Apa, and therefore the *Vollgriffsschwert*, was invented in the Carpathian basin toward the end of the Bz A2 or the beginning of the Bz B period, and that it was roughly contemporary with the Shaft Graves at Mycenae.⁷³

The Vollgriff swords were shorter, and often much shorter, than the rapiers: the two found at Apa (nos. 25 and 26 in Bader's catalogue) were only 62 and 56 cm in length. The hilts of the all-metal swords were regularly stippled, striated or pocked, so as to reduce the contact of the metal with the palm of the hand. The Apa and other Vollgriff swords continued to be highly prized in the Carpathian basin all through the Bronze Age. More than 500 Vollgriff swords from the basin and western Serbia have been published.⁷⁴

Although very serviceable as a weapon, the Vollgriff was intended to be just as much a status symbol as the Type A rapier had been. The decoration of the hilt of a Vollgriff sword included simulated rivet-heads. The simulation indicates that, although the new metal hilt was far more reliable, the old organic hilt with its rivets was more prestigious. Both hilt and blade of the Vollgriff were elegantly decorated, often with horizontal grooves on the hilt, curvilinear patterns on the shoulder, connecting with vertical grooves running half way down the blade. Late in the Bz A2 period the Carpathian basin had a long tradition of bronze working,

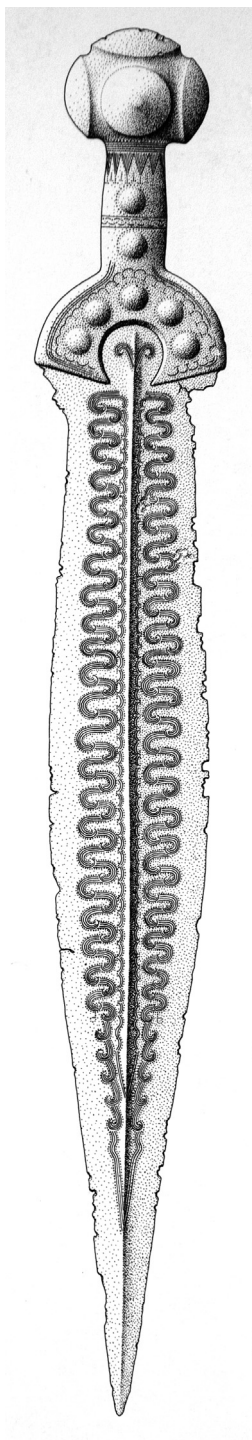
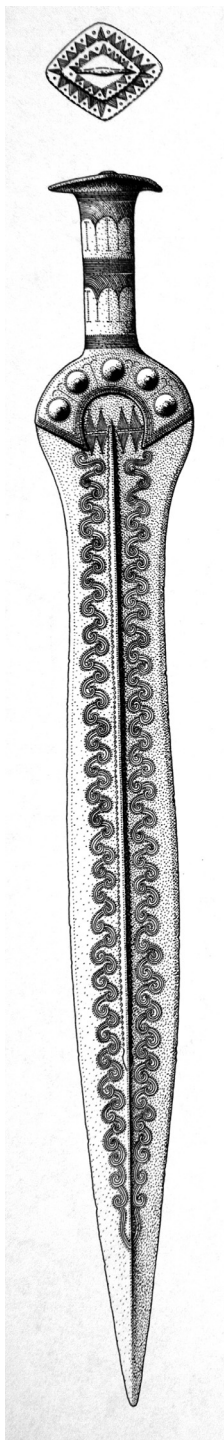


Figure 5.3a and 5.3b
Swords found at Hajdúsámson
and Apa. From Kemenczei 1991,
Tafel 1, no. 1, and from Bader
1991, Tafel 5, no. 25. Courtesy
Franz Steiner Verlag

but it is doubtful whether foundries there had ever produced anything quite so beautiful as the Vollgriff sword, an artifact designed specifically to kill men. The man who carried such a sword was proud to advertise himself as both a warrior and a man of substance. The Boiu sword, which appeared at the same time or slightly later than the Apa, was even more ornate. The circular grooves on the shoulder may have been meant to represent eyes. As interpreted by Mark Pearce, each of the Boiu swords may have been invested with a “spirit” and possibly a name.⁷⁵

By ca. 1400 BC a sword superior to the Apa and the Boiu was in use at the western end of the Carpathian basin. This was the Sprockhoff Ia, a cut-and-thrust *Griffzungenschwert* and in some respects the first true slashing sword. J. D. Cowen was insistent on locating the origin of the flange-hilted cutting sword in central Europe (or, more narrowly, in Hungary): first came the Boiu, then the Sprockhoff Ia, and finally the Naue Type II.⁷⁶ Although both the Boiu and the Sprockhoff Ia were effective for either a thrust or a slash, the improvements in the Sprockhoff Ia made it a more reliable slashing weapon. The sword was between 70 and 80 cm long, and its blade was much less tapered than that of a Boiu (the Boiu is often described as a rapier). The blade of a Sprockhoff Ia was close to 3 cm wide, and was strengthened by its high midrib. The flanged hilt, into which organic hilt-pieces were inserted, was much easier to grasp than the Apa’s Vollgriff. Soon after its development in central Europe the Sprockhoff Ia appeared in the far north of Europe, where most of the *in corpore* specimens have been found. Remarkably, in less than two centuries swords in the Carpathian basin had evolved from the wobbly Type A rapier to an extremely effective and sturdy sword that was to remain standard—first in bronze and then in iron—until the middle of the first millennium BC.⁷⁷

Axes in the Carpathian basin

Although axes are another sign of militarism in the Carpathian basin their meaning and utility are debated. In the ancient world axes were often a sign of religiously sanctioned authority, the most well known being the double axe of Minoan Crete, the *labrys* of southwest Anatolia, and the fasces of Etruscan cities and Rome. In prehistory “Ötzi the Iceman” carried a copper-bladed axe, and throughout the Neolithic period the stone “battle-axe” was a common accoutrement for adult males in Europe. This tradition continued in the Bronze Age. The hundred axe-heads in the Dermsdorf hoard show that in the Únětice culture there was a strong demand—from the gods as well as from ambitious mortals—for impressive axes. The Dermsdorf axes were somewhat small and not very securely hafted, being flanged rather than shaft-holed, but shaft-holed copper axes had been in use since ca. 3000 BC: first in the Near East but soon in northern Caucasia, and in temperate Europe at least by 2500 BC.

In the middle of the second millennium BC we meet something much more impressive than the Dermsdorf axes and more than twice their weight, although

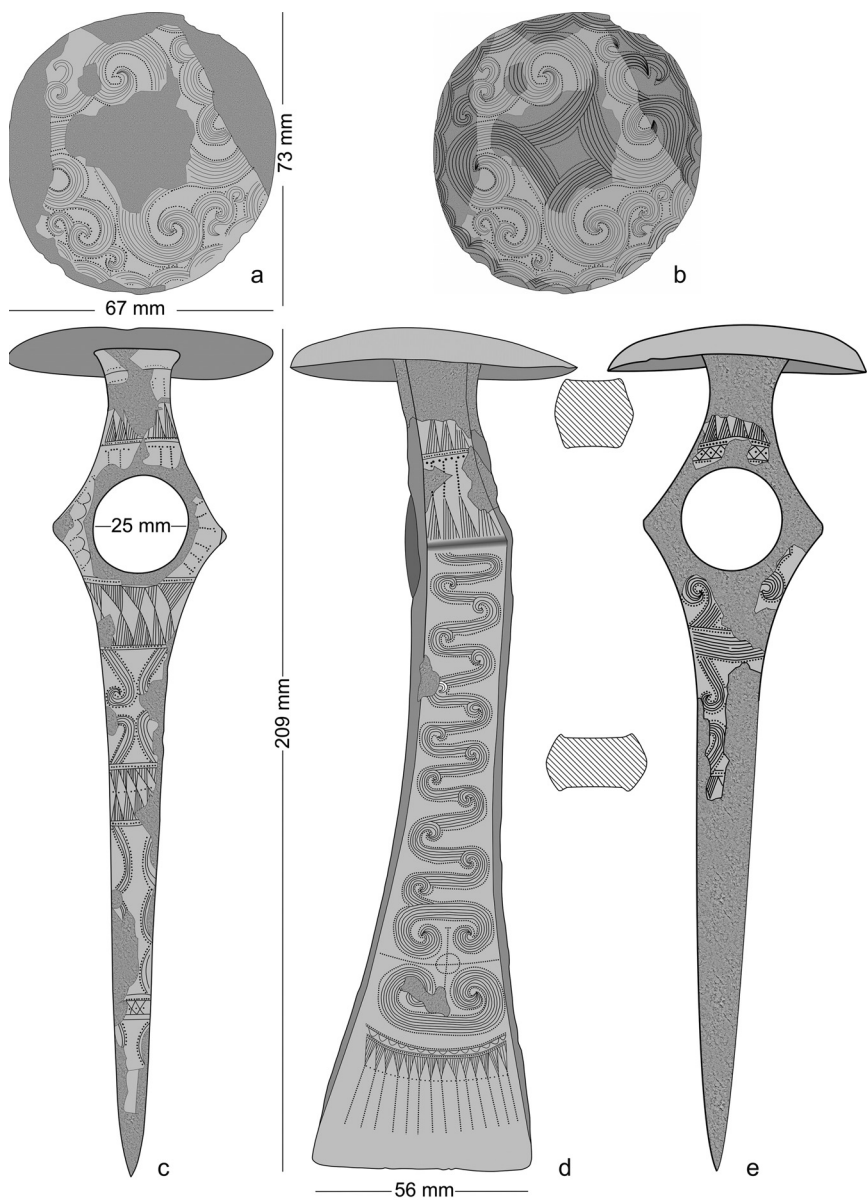


Figure 5.4 Disk-butt axe found at Iorcani, eastern Romania. From Tencariu et al. 2014, Figure 3. Courtesy *Studia Antiqua et Archaeologica* and Felix-Adrian Tencariu

still meant to be wielded with one hand: a shaft-holed bronze axe with a diskbutt. A few of these have been found in the Czech Republic, Slovakia, Austria and southern Scandinavia. Between 80 percent and 90 percent, however, come from Transylvania, western Romania and eastern Hungary: well over 300 have been found there. In Alexandru Vulpe's catalogue of 570 bronze axes from Romania, 278 are disk-butted.⁷⁸ Vulpe concluded that they were produced especially toward the middle of the Romanian Middle Bronze Age, or toward the transition from the Bz B to the Bz C period.⁷⁹ They were prized, however, as early as the Hajdúsámson hoard, ca. 1500 BC on our chronology.

These disk-butted axes were often elaborately decorated with either incision or chasing, the *Wellenband* ("wave band") being especially favored. An axe beautifully decorated with a *Wellenband* was found by chance in 1989 during agricultural work at Petrova Ves, in northwestern Slovakia.⁸⁰ On another axe, found at the eastern Romanian village of Iorcani in the 1950s but only recently published, the entire surface was once covered with chased decoration.⁸¹

Disk-butted axes show up as single finds, in hoards, and in votive deposits (none has been found in a settlement), and must be regarded as a symbol of high status. Because swords and spears were available, and a man could not wield more than one weapon at a time, it is doubtful that the axe was primarily a weapon.⁸² Twelve disk-butted axes (with much decoration) were buried with the Apa sword at Hajdúsámson, however, and that suggests that the axe did have military connotations. Appropriate here is speculation about the Iorcani axe:

What was the disk-butted axe from Iorcani: a weapon or an insignia? One can assume based on its original appearance and intricate decoration that it was meant to be foremost a ceremonial weapon, a symbol of wealth, power and/or warrior skills; at the same time, its design, blade and weight are clues that, in case of necessity, the axe could also be a deadly weapon.⁸³

Whatever its purpose, the disk-butted axe seems to have been a favorite with a military class in and around the Carpathian basin from the end of the Bz A2 to the Bz C period.

Spears in the Carpathian basin

Bronze spearheads came to the Carpathian basin late in the Bz A2 period. In his comprehensive study of the Otomani-Füzesabony culture, Matthias Thomas included spears as one of the important novelties in western Romania and eastern Hungary at this time.⁸⁴ The spear, although not with a metal head, had been known forever in temperate Europe: even Neanderthal hunters seem to have used spears with stone heads to bring down their prey. Metal spearheads, however, were apparently unknown in temperate Europe until the second quarter of the second millennium BC. This was not only 700 or 800 years later than their first use in the Near East, but also 300 years after they had come into use in southern Caucasia and on both sides of the Ural mountains. Not surprisingly, when metal spearheads

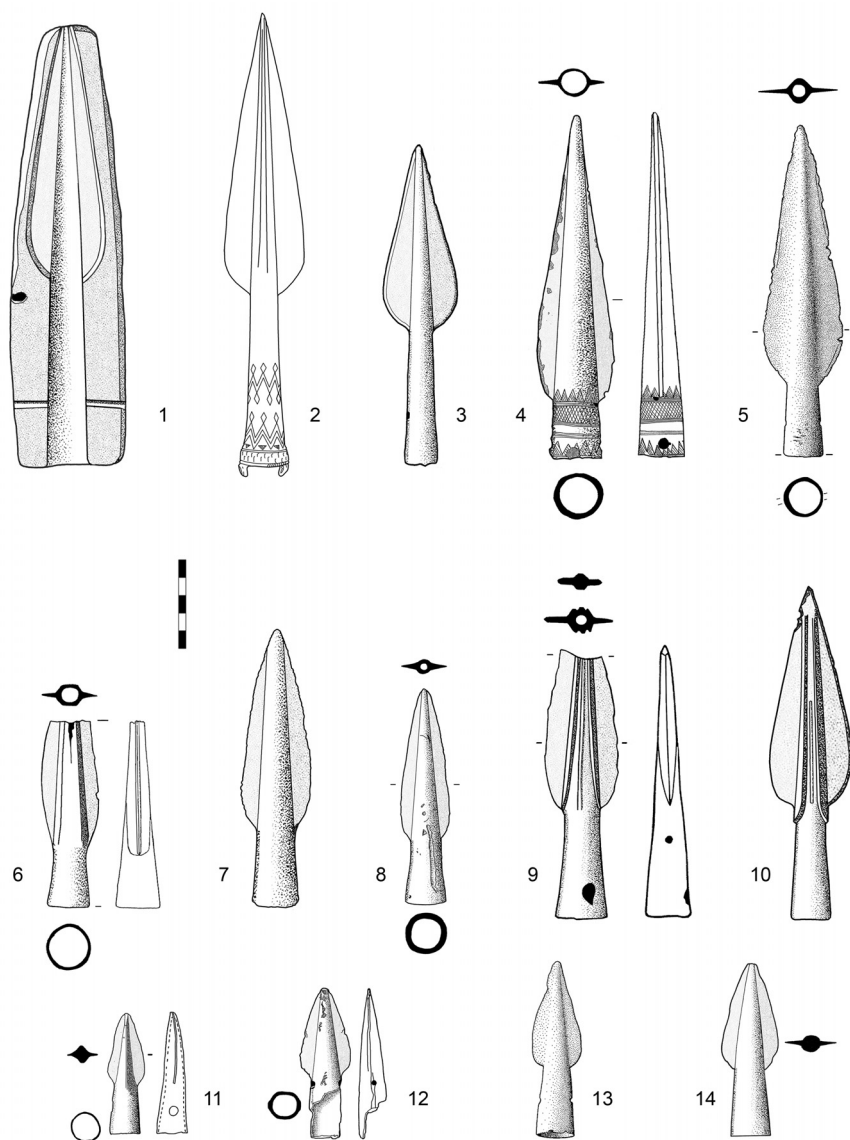


Figure 5.5 Late Bronze Age spearheads and javelin heads from Bulgaria, including (no. 1) the mold from Nova Zagora. From Figure 3 in Leshtakov 2011. Courtesy *Archaeologica Bulgarica* and Lyuben Leshtakov

finally arrived in the Carpathian basin they were fully fledged. In the Near East spearheads were for several centuries attached to their shafts by tangs, and the tang was not replaced by the socket until ca. 2000 BC. In temperate Europe even the earliest metal spearheads were socketed, indicating that they were brought in from some place where socketed spearheads were familiar. Unlike their counterparts in the Shaft Graves at Mycenae, the earliest spearheads in the Carpathian basin were cast (by the lost-wax method) rather than forged.

On present evidence we may say that the metal spearhead came to the Carpathian basin within—but closer to the end than to the beginning of—the Bz A2 period. In our chronology we may place its arrival ca. 1600 BC. At the important tell-settlement of Feudvar in Serbia a stone mold for the casting of bronze spearheads was found in the destruction level that separated the Early from the Middle Bronze Age (or Bz A2 from Bz B).⁸⁵ In Moravia also the earliest bronze spearhead seems to date from late in the Bz A2 period, although a copper object from the Bz A1 period has sometimes been interpreted as coming from a spearhead.⁸⁶

Throughout the Bronze Age the spear had much less prestige than the sword, and although some spearheads were decorated most were not. While the owner of a sword was proud to be seen in public with his sword suspended from a belt or a baldric, it is difficult to imagine a man strutting around his town with a spear. The disparity between spear and sword is reflected in scholarship. Bronze Age swords have been very well published, but publication of spearheads from the same period has been slow. Hundreds of bronze spearheads have been found in Romania and Hungary but still await cataloguing, and the number of unpublished spearheads from all of temperate Europe runs in the thousands.⁸⁷ We are fortunate that a considerable part of the story of the spear in Bronze Age Bulgaria has now been reconstructed.⁸⁸

It is obvious from the numbers that the spear became very important as a weapon in the Carpathian basin and elsewhere in temperate Europe. In northern Italy, the Pila del Brancon votive deposit from ca. 1200 BC included ten times as many spears as swords. Surprisingly, however, for a long time after the spear's introduction in temperate Europe the demand for it seems to have been relatively limited. Of the dateable Moravian spearheads catalogued by Jiří Říhovský, only seven date from the Bz A2 through the Bz C periods, while more than 100 date from the Late Bronze Age.⁸⁹ This suggests that although warfare in temperate Europe was endemic by the end of the second millennium BC, in the middle of that millennium it was not.

The late appearance of bronze armor in temperate Europe

Another pointer in the same direction is the considerable delay in the manufacture of defensive armor in temperate Europe. It is likely that already in the Bz A2 period the man who was armed with a sword or a spear wore a leather helmet and corselet and carried a leather shield stretched over a wooden frame, but these would not have given the man much protection against an opponent's sword or spear or against an arrow shot from a composite bow. Already by 1600 BC chariot crews in the

Near East were protected by scale corselets, and in Greece plate armor was worn by chariot drivers at least by the end of the fifteenth century BC. In temperate Europe, in contrast, bronze armor and shields are unattested until late in the Bz D period. Marianne Mödlinger has studied this closely and gives us a succinct summary:

Bronze Age European metal defensive armour, as opposed to weapons, is scarce. With a few exceptions such as the armour from Biecz, Dendra or Knossos, the first armour appears in Central and Eastern Europe in the beginning of the Urnfield culture (ca. 1300 BC).⁹⁰

Mödlinger goes on to say that “we know of approximately 120 helmets, 95 shields, 55 greaves and 30 cuirasses from the European Bronze Age,” but most of these date from the centuries just before and just after 1000 BC.

Marion Uckelmann, whose catalogue of European bronze shields was published in 2012, found that the earliest known bronze shields in Europe were made in the Bz D or the Ha A1 period, and no earlier than the thirteenth century BC. The earliest (nos. 1–6 in Uckelmann’s catalogue) are the Lommelev types, named after a type-site in Denmark but coming mostly from hoards deposited in the Carpathian basin.⁹¹ On the use of bronze shields as such, Uckelmann proposed that “their development and spread should probably be seen in relation to the use of swords,” and he is probably correct.⁹² Because in temperate Europe metal shields lagged some 300 years behind the appearance of swords, however, it is reasonable to wonder how frequent was the use of swords or of any other weapons in combat in the Bz A2–Bz C periods.

Militarizing of the Carpathian basin: summary

The advent of cheekpieces and battle weapons in the Carpathian basin indicates that ca. 1600 BC much of the basin—beginning with Transylvania—was taken over by men equipped with chariots, axes and spears. Soon after their arrival the military men obtained Type A rapiers to display their position, and within a generation or two they replaced the Type A with the shorter but much more serviceable Apa sword. The intruders evidently came from a land where chariots were drawn by horses bridled with *Scheibenknebel* cheekpieces, and that points to the steppe beyond the Dnieper. Motivation for the takeover seems to have been the gold and copper in the Carpathian and Apuseni ranges.

Beyond these conclusions, based on the material record, we must resort to speculation. The intruders probably came on ships over the Black Sea and up the Danube. And the takeover may have proceeded piecemeal over several years, with each of several expeditions taking control of yet another portion of the metal-rich ranges. We need not imagine that the expeditions together consisted of more than a few hundred chariots and a few thousand men, enough to take control of a population of a few hundred thousand people who had neither chariots nor any military tradition.⁹³

Although these would have been entirely military expeditions, after their domination was established the men would have fetched their wives, children and faithful retainers. Because the military forces must have come from far to the east, where Indo-European languages were apparently widespread, I will suggest that the militarizing of Transylvania, western Romania and eastern Hungary ca. 1600 BC may have been the starting point for the Keltic, Italic and Germanic subgroups of Indo-European, as well as for Albanian and for extinct but once-important languages such as Venetic and Dacian.

Swords, spears and axes in southern Scandinavia

The trail of Apa swords and of other weapons leads out of the Carpathian basin, rich in metals, to Denmark and southern Sweden. Although southern Scandinavia had no metals, it was a primary source of amber. Baltic and North Sea amber had been prized in northern Europe all through the Neolithic period, and ca. 1600 BC it began to make its way to the Mediterranean and the Near East.

A military takeover ca. 1500 BC seems to have occurred in northern Germany, Denmark and Sweden, but not on the Polish and Lithuanian-Latvian coasts of the Baltic, where amber was at least as plentiful as along the Danish and Swedish coasts. In all of Poland and Lithuania the only battle weapon dating so early as the middle of the second millennium BC is a sword found recently in a tumulus burial, at Gorzyca, a village on the Oder river that separates Poland from Germany.⁹⁴ A map created by Helle Vandkilde, a specialist on the Nordic Bronze Age, shows very clearly the swath of influences and imports leading from the Carpathian basin to Denmark and southern Sweden, but not affecting the lands along the southern and eastern shores of the Baltic.⁹⁵

In contrast to the absence of weapons farther east, nine find-spots of the Apa sword lie in northern Germany, Denmark and southern Sweden. A tenth find-spot of Apa swords came to light in 1999, when treasure hunters at Nebra, in east-central Germany, came upon two short swords in a hoard that contained the “Nebra sky-disk” that quickly caught the world’s attention.⁹⁶ The hilt of the two swords is very similar to that of the Apa swords. The Nebra hoard seems to have been deposited early in the fifteenth century BC. Although six swords of the Apa-Hajdúsámson type had earlier been found in southern Scandinavia (primarily in Denmark) a sensational find in 1993 added eight more. These came from a hoard discovered in a potato field near Dystrup, on a Jutland promontory into the Kattegat sea.⁹⁷ Although in most Apa swords the blade and the hilt were cast separately, in the Dystrup swords the blade and hilt were cast together. The earliest Apa swords from Denmark seem to be contemporary with those from Nebra, and on the chronology followed here would date from shortly before or shortly after 1500 BC.⁹⁸

The rapid spread of the Apa sword from Romania through Germany to Denmark is remarkable, and must be taken into consideration in discussions of the Indo-Europeanizing of southern Scandinavia. With stimuli from the Carpathian basin the Nordic Bronze Age began in a “breakthrough,” as has now been argued



Figure 5.6 Four of the Apa swords found at Dystrup. Courtesy John Lee and the National Museum of Denmark

forcefully by Helle Vandkilde.⁹⁹ She puts special emphasis on the “warriorhood” that commenced in Scandinavia along with the Nordic Bronze Age and that linked Scandinavia to the Carpathian basin and the Aegean. Vandkilde also suggests that the three areas were linked in an Indo-European framework.¹⁰⁰

The Apa was only the first of the many swords found in southern Scandinavia. The formidable Sprockhoff Ia, a flange-hilted slashing sword, was apparently developed in the Carpathian basin but was most favored in southern Scandinavia. As J. D. Cowen showed, Denmark has yielded more specimens of the Sprockhoff Ia than all the rest of Europe combined.¹⁰¹ The earliest of these cut-and-thrust swords date from the late fifteenth century BC.

Bronze spearheads came to southern Scandinavia along with swords, but not much has been done with them. Reviewing the weaponry of Period I of the Nordic Early Bronze Age, Christian Horn observed that “studies of Bronze Age weaponry are mainly concerned with swords and neglect spearheads.”¹⁰² Horn restored some balance to the topic by inspecting 154 bronze spearheads, as well as fifty swords, from the EBA I in Denmark and southern Sweden. His conclusion was that the spearheads show as much use-wear as do the swords.

Whether bronze axes were part of the new weaponry in southern Scandinavia is not clear. A few of the same disk-butted axes that were prized in the Carpathian basin have shown up in the Bronze Age Ib period of Scandinavia. Vandkilde believes, although with some reservations, that these axes were weapons.¹⁰³ They appear in the company of spears and very efficient swords, and so certainly had military connotations, but the likelihood is that when a weapon was actually needed a warrior would probably not have chosen his axe. That the axes here were gifts

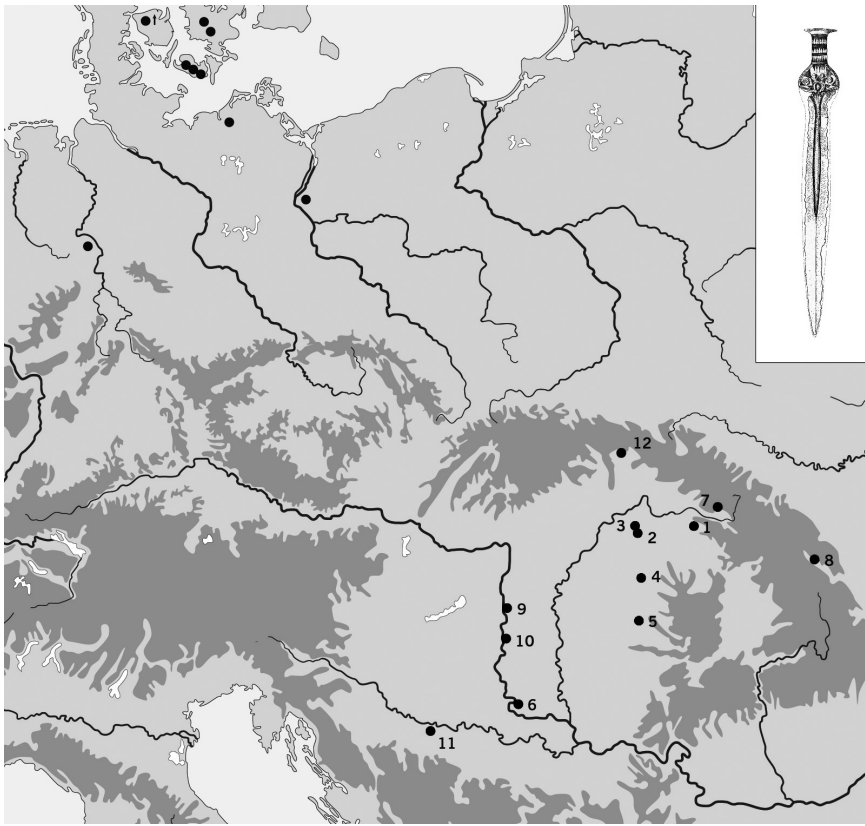


Figure 5.7 Find-spots of Apa- Hajdúsámson swords. From Metzner-Nebelsick 2013, Abb. 1 (based on Bader 1991, Kemenczei 1991, Harding 1995 and other studies by R. Munteanu and G. Dumitroaia, T. Kovács, H. Meller and B. Sicherl). Courtesy Landesmuseum für Vorgeschichte, Halle, and Carola Metzner-Nebelsick

to the gods is probable. In late spring of 2015 nine bronze axe heads and a bronze spearhead were found in what appears to have been a ritual deposit at Boest in eastern Jutland. The axes were flanged, rather than shaft-hole axes, and were not disk-butted. Five of them are massive, each weighing almost a kilo, and probably were made to serve as a dedicatory offering. According to Constanze Rassmann, curator of the Museum Midtjylland, the deposit has been tentatively dated ca. 1600 BC (1500 BC on my chronology).

Ships in southern Scandinavia

It is very likely that in southern Scandinavia the long ship—propelled, like a pentekonter, by dozens of rowers—was an innovation that came with the region's

militarizing and its entry into the Bronze Age. In Neolithic Scandinavia boats were small, and were either made of skin or were dug out from logs.¹⁰⁴ This primitive tradition persisted into the second millennium BC, but with the Nordic Bronze Age came a much more seaworthy craft: the long ship made from planks and rowed by lines of men seated abreast. How important the long ship was in the Nordic Bronze Age is shown by its prevalence in rock carvings in Norway, in Denmark and especially in the Bohuslän and Östergötland provinces of southern Sweden. The long ship was also a favorite decorative motif on bronze objects, and these have been especially helpful for establishing a chronology (some 800 ship images have been found on some 400 bronze objects from the Nordic Bronze Age, most of the objects coming from graves).¹⁰⁵

Until recently the ship images did not attract much attention, but this is changing, thanks in part to work done by Johan Ling. Ling's 2008 dissertation at the University of Gothenburg has now been published as *Elevated Rock Art: Towards a Maritime Understanding of Rock Art in Northern Bohuslän, Sweden*.¹⁰⁶ Ling's starting point is the consensus among geologists that the land in southern Scandinavia has been slowly elevating since the end of the Ice Age, and that the uplifting of the land has exposed much of the coastal landscape that 4000 years ago was still under water. Ling attempts to understand the rock art of Bohuslän within the context of the Bronze Age landscape/seascape, and also to show that the varying locations of the rock carvings reflect the progressive retreat of the sea from the rock (thus allowing him to reconstruct a probable chronology for the carvings). The rock art has traditionally been seen as carved by farmers and pastoralists in their idle hours, but when the carvings were made most of them were visible from the sea and some were visible only from the sea.

Since the BA, however, the landscape has been transformed by shore displacement, so today most of the rock art, on bedrock of granite or gneiss, is located around 10 km inland. The most common figurative image is the ship; the region is known to contain some 10,000 ship images.¹⁰⁷

Ling places the earliest of the ship images at the end of the Ia and the beginning of the Ib period of the Nordic Bronze Age, or shortly before 1500 BC on the historical chronology.

The maritime tradition of the Nordic Bronze Age was apparently initiated by contact with the eastern Mediterranean cultures, and it is very likely that the amber trade lay behind the extension of the Mediterranean maritime tradition to Scandinavia. Before amber was carried over a land route through central Europe, that is, it seems to have been brought to Greece by ships: from the North Sea through the English Channel, around Gibraltar, and then through the Mediterranean.¹⁰⁸ Kristiansen and Larsson pointed out that in Bronze Age Scandinavia and in Mycenaean Greece there were not only "shared traditions in picturing ships during 1700–1400 BC,"¹⁰⁹ but also similarities in the way that ships were designed and built:

The early Nordic Bronze Age ships are in form and construction clearly inspired by east Mediterranean ships. Ships are very complex constructions, transmitting tradition. The construction of the Nordic sea-going Bronze Age ships as depicted in rock art and an early example on the Rørby sword from the seventeenth or sixteenth century (Figure 92) could hardly have originated in small drawings. It demanded an understanding of the craftsmanship behind the techniques of bending the wood for the high curved stems, and for the complex double construction of both keel and stem.¹¹⁰

The Rørby sword, a chance find in 1957, has a tip curled upward and inward, imitating the curved prow of a ship, and was obviously meant for display rather than for battle. Along its blade is the image of a “pentekonter” propelled by at least fifty oars. Like the other decorations on the sword, the “pentekonter” was not engraved or incised on the bronze, but was included in the casting, thus indicating that other swords with the same image were produced in the foundry.

Chariots in southern Scandinavia

Chariots too may have come to southern Scandinavia at the same time as bronze swords, spearheads, axes and ships. Because southern Scandinavia had until then been still in the Neolithic period, and hardly acquainted with warfare, it is again conceivable that a few hundred well-armed men from the south could have taken over a considerable stretch of the shore where amber was being collected. The many swords and spearheads that have been found suggest that a takeover was accomplished by men on the ground rather than in chariots, but at least a few chariots may have been (or may have soon become) part of the scene. Chariots and spoked wheels appear often—although not nearly so often as ships—in Scandinavian rock carvings and these have been studied in exhaustive detail by Jens Johannsen.¹¹¹ Johannsen catalogued 116 rock carvings of two-wheeled chariots, the wheel having four spokes, and another fifty-four of two-wheeled vehicles in which the wheels are shown simply as circles without spokes.¹¹² The images cannot be securely dated, but Johannsen puts the earliest in Period I of the Nordic Bronze Age, which he dates to 1700–1400 BC.¹¹³ He does not reckon with a military takeover of southern Scandinavia, suggesting only “that an import of chariot-like carts took place in the earliest Bronze Age.”¹¹⁴ The most famous evidence for Scandinavian chariots is the Trundholm (Denmark) sun-cart, the date of which is also much disputed (it could be as early as 1500 BC, or as late as 800 BC).¹¹⁵

Quite definitely early in the Nordic Bronze Age, but difficult to interpret, is evidence that comes from a votive deposit found in 1887 in a bog at Gallemose in Jutland.¹¹⁶ During the Bronze Age the bog was a lake, and the votive deposit was lowered into the lake some 50 m from the shore. The deposit contained axes and rings, and also what seem to be bronze fittings to a chariot yoke.¹¹⁷ All of the bronze items together weighed slightly more than 12 kg. As commented by Klavs Randsborg, who has especially studied the Gallemose hoard, a dozen kg of bronze

was a very costly sacrifice to make in Denmark, a land that was not producing its own copper.

Less spectacular evidence, but more securely tied to chariots, comes from a few antler tip cheekpieces. In his catalogue of central and eastern European cheekpieces from the Bronze Age, Hüttel concluded that in all of northern Europe the only cheekpieces certainly from either the Early or the Middle Bronze Age are two Stangenknebel (nos. 109 and 110 in his catalogue) from Østrup Bymark, on the eastern coast of Zealand.¹¹⁸ Johannsen reports that other Stangenknebel have been found at a site in northern Jutland, and that still others may lie in Danish museums,¹¹⁹ but until one or more of these are published the specimens from Østrup Bymark are our only verifiable cheekpieces from the Nordic Bronze Age I and II periods.

The evidence for chariots in southern Scandinavia, or northern Europe, in the Bz A2 or the Bz B period is limited, but the evidence for militarization is substantial. It seems to have been introduced, ca. 1500 BC, by an organized force from the Carpathian basin, the leaders armed with Apa swords or with axes and their followers carrying spears. The motivation for a takeover was probably the amber along the coasts of Denmark and southern Sweden, although the eastern Baltic—which was at least as rich in amber—was not taken over (northern Poland and the Baltic states have not yielded the military artifacts found so frequently in southern Scandinavia). The language that the military men and, a bit later, their families and dependents brought with them to southern Scandinavia would soon have been affected by the language or languages of the native population. If a Proto-Baltic language had indeed been spoken in much of northeastern Europe since the middle of the third millennium BC (as is suggested by DNA evidence for a considerable influx from the eastern into the western regions of the Corded Ware culture), we would in southern Scandinavia have the juxtaposition of two Indo-European languages. With due caution and no credentials as a linguist, I will suggest that the militarizing of southern Scandinavia may have been the origin of the Germanic subgroup of the Indo-European languages.

Swords in northern Italy

The militarizing of northern Italy—the land between the Apennines and the Alps—seems to have proceeded from western Hungary, and to have occurred at about the same time as the militarizing of southern Scandinavia: in the middle of the second millennium BC. Perhaps northern Italy was attractive because of the fertility of its soil, but a more compelling attraction would have been the metalwork done there. In addition, northeastern Italy was important for the amber trade. The routes through central Europe by which amber was brought down from the Baltic and the Kattegat sea to the Mediterranean are not very clear, but by the end of the fifteenth century BC much of the amber seems to have been coming overland through the eastern Alps to the top of the Adriatic, where it was transferred to ships and then carried to various ports in the eastern Mediterranean. Anthony Harding and Helen Hughes-Brock, in their study of amber in the Mycenaean world,

saw the transfer of amber from the overland route to ships as occurring along the northwestern shores of the Adriatic, and that “it is here that middlemen must have come into their own.”¹²⁰

The militarizing of northern Italy was approximately contemporary with the beginning of the Terremare culture in the central Po valley, but it is not yet clear which came first. In his review of northern Italy, for the *Oxford Handbook of the European Bronze Age*, Franco Nicolais employs the following chronology—based on carbon dates—for the Bronze Age of that region:¹²¹

EBA 2300/2200—1650 cal BC

MBA 1650—1350/1300 cal BC

LBA 1350/1300—1200 cal BC

Final BA 1200—900 cal BC

On the historical chronology used in this book, the Middle Bronze Age in northern Italy would be lowered to ca. 1550–1300 BC. It was early in this Middle Bronze Age that the Terremare culture began, mostly in the Emilia-Romagna region. The Po valley had a small population in the EBA, but in the MBA I period the population soared. The *terramaricoli* built villages, surrounding each with a ditch and an earthen rampart, and at the same time began systematically to turn the surrounding forests into fields. The changes apparently happened quickly. According to Andrea Cardarelli, “Already in the initial phases of the MB2, the settlement evidence confirms that the Po Plain was completely colonised, establishing a widespread network of hundreds of villages which do not seem to extend beyond two hectares in size.”¹²² The Terremare culture, which depended both on the fertility of the soil and on the production of bronze artifacts, continued through the Middle and the Late Bronze Age of northern Italy, but then came abruptly to an end. In Cardarelli’s summary, “after over four centuries of life, the world of the Terramare collapsed within an apparently brief space of time, leaving the territory uninhabited for at least three or four centuries.”¹²³ Although it is clear that in the Middle and Late Bronze Age a military class lived in the villages, alongside the “producers” (to use Dumézil’s term), we cannot say whether the military class presided over the creation of the villages or whether it asserted itself over villages that had already been established.

As is the case elsewhere, the militarizing of north Italy is most evident from the swords found there. In 1970 Vera Bianco Peroni published a catalogue of 395 bronze swords (and several accompanying sheathes) from Italy.¹²⁴ Subsequent discoveries have added considerably to that number. All of the Italian swords date from after Italy’s Early Bronze Age, so let us say after 1550 BC. Bianco Peroni’s Tafel 67 shows the find-spots for all of the Italian swords known to her. If we divide Italy approximately in half, with the dividing line drawn from Satricum on the Tyrrhenian coast (the sword found there is Nr. 255 in Bianco Peroni’s catalogue) to Sulmona (Nr. 138) on the Adriatic, we find that only fifteen of the bronze swords come from south of that line while 380, or 96 percent, come from north of it. Although central Italy has furnished a modest number of bronze swords,

almost all of the early swords come from the far north. They come, that is, from the Po valley and also from Italy's far northeast: the Veneto and Friuli-Venezia Giulia regions, where Venetic was once spoken.

Most of the bronze swords found since Bianco Peroni's publication again come from the north. Forty-three have recently come from a Bronze Age cemetery at Olmo di Nogara, near Verona, and at least ten more from the nearby votive deposit in the Tartaro river, at Pila del Brancon.¹²⁵ The deposit is dated ca. 1200 BC, but the forty-three swords from the cemetery—most of them were placed along the thigh or across the breast of the deceased—are much earlier than the Pila del Brancon deposit. Luciano Salzani and his colleagues identified three phases in the Olmo di Nogara necropolis, the first two phases belonging to the Middle and the third belonging to the Late Bronze Age. Salzani equates the first phase with the Bz B2 and Bz C1 periods in central Europe. In graves of this phase, which should be dated ca. 1450–1350 BC on our chronology, the excavators found many swords of the Sauerbrunn and Boiu type.¹²⁶ Salzani's summary statement about the graves of all three phases at Olmo di Nogara is worth noting: "The figure of the warrior is that which emerges most clearly from an analysis of the male grave goods, and his role is exalted by the deposition of a sword."¹²⁷ The swords come from inhumation graves of adult males, several of whom were old.¹²⁸

Almost half of the bronze swords from Italy (nos. 85–271 in Bianco Peroni) are sturdy *Griffzungenschwerter*. Many of these date from the Late Bronze Age and the Final Bronze Age, and many of them come from the Terremare region. Some of the Griffzungen swords, however, and most of the Griffplatten and Griffdorn swords date from the Middle Bronze Age. Of special interest are those swords that date early in the MBA, and they come not from the Po valley but from the Venetic northeast. In Bianco Peroni's catalogue, the earliest swords in Italy are seven Sauerbrunn rapiers. These are poorly hilted *Griffplattenschwerter*, in which the blade—beautified with elaborate incisions—is topped by a flat grip plate for insertion into a slot in the organic hilt. The hilt, which very likely was also elaborately decorated, was then attached to the plate by four or six rivets. The result was a hilt hardly superior to that of the Type A rapier (the Type A had a short tang, and the Sauerbrunn had no tang at all), and far below the hilt of a Griffzung sword. Peter Schauer found it "amazing" how unsatisfactory was the hilt of the Sauerbrunn and he pointed out the many grip plates on which the rivet holes were torn through, a clear sign that the blade had come loose from the organic hilt.¹²⁹ Because of the torn rivet holes, one must suppose that although these rapiers were clearly status symbols they must also have been used, whether in combat or in swordplay.

Although Sauerbrunn swords have now been found in the Olmo di Nogara cemetery, all of the Italian Sauerbrunns known to Bianco Peroni came from the Treviso province, so not far from the pass that leads through the eastern Alps from Austria. Related closely to swords in the Carpathian basin, they may have come along the route now traversed by Austria's Süd Autobahn (A2), which runs from Graz and Klagenfurt to Italy's province of Udine. The Italian Sauerbrunns were dated by Bianco Peroni to the beginning of the Bz B period, or soon after 1500 BC

on our chronology.¹³⁰ The Sauerbrunn type originated in central Europe (the eponymous sword was found in 1895 at Sauerbrunn, near Wiener Neustadt in eastern Austria) and was especially to be found in Hungary. In Kemenczei's catalogue of Hungary's Bronze Age swords and daggers the first sixty-three entries are all Griffplatten weapons.¹³¹ Many of the daggers date from the Early Bronze Age and even the Chalcolithic period,¹³² and it appears that at the end of the Bz A2 or the beginning of the Bz B period central European founders simply applied to rapiers the hilt technique that they had long been accustomed to use for daggers. Pressed by the military class to produce rapiers, that is, metalworkers began casting Sauerbrunns.

With an improvement in hilt the Sauerbrunn soon was replaced by the Boiu-Keszthely rapier. Early examples of this type (the Boiu 1b) had a short and flat tang that extended two or three cm into the hilt. The later examples had a longer tang, extending all the way to the pommel, and the tang was flanged, so that organic plates could be inserted into the flanges.¹³³ The Boiu-Keszthely swords are named for Boiu, the village in Transylvania where the type was first found, and for Keszthely in western Hungary, where soon thereafter a very similar sword was found in a tumulus burial. Although Boiu is in Transylvania, the type probably did not originate there. Judging by the find-spots, we would agree with J. D. Cowen that the original center for the type was further to the west, in Hungary.¹³⁴

The Boiu had a secondary center, however, in northern Italy.¹³⁵ Stephan Foltiny, who studied the evolution from the rapier to the slashing sword, counted twenty-one early Boiu-Keszthely rapiers, coming from nineteen sites.¹³⁶ Eight of the nineteen sites known to Foltiny are in northeast Italy, all in the Udine and Treviso provinces (again, the recent finds at Olmo di Nogara have extended the Boiu zone into the northern reaches of the Terremare culture). The early Boiu rapiers date to the Bz B period, and Foltiny placed them more precisely near the transition from the Bz B 1 to the Bronze B 2 period.¹³⁷ We are safe in assuming that they were to be seen in northeast Italy in the first half of the fifteenth century BC. The later Boiu-Keszthely rapiers, in both northern Italy and Hungary, are *Griffzungenschwerter*, and can be dated to the fourteenth century BC.¹³⁸

Of Foltiny's eight find-spots for the well-developed Boiu-Keszthely, three are in Italy (two of the spots, Melma and Quinto, are near Treviso). The sword's improvement continued in northern Italy as it did in Hungary, the Boiu rapier evolving into the Sprockhoff Ia slashing sword during the Bz C period. Six of the Sprockhoff Ia swords have been found in northern Italy.¹³⁹ The redoubtable Naue II, with a cutting blade "leaf-shaped" in order to increase its weight toward the tip, may even have originated in northern Italy.¹⁴⁰

Spears in northern Italy

The votive deposit made ca. 1200 BC in the Tartaro river, at Pila del Brancon near Verona, contained not only at least ten swords but also at least fifty-one spears, topped with socketed bronze spearheads. Anna Bietti Sestieri and her colleagues suggested that the defeated force consisted of at least ten swordsmen, each

commanding five men armed with spears.¹⁴¹ The importance of spears during earlier periods of the Bronze Age of northern Italy is difficult to estimate because, as elsewhere, the bronze spearheads of the area have not yet been catalogued. Apparently, however, many more spearheads from the LB period have been found than from the MB period.¹⁴² The Val Camonica rock carvings show men fighting with spears that clearly have metal heads, but those carvings probably date early in the first millennium BC.¹⁴³

Chariots in northern Italy

The evidence for chariots in northern Italy comes mostly from the Terremare culture in the central Po valley, some 150 to 200 km southwest of Treviso, and it is quite robust. Eugen Woytowitsch, gathering together the evidence for wheeled vehicles in Italy during the Bronze Age and the Early Iron Age, found and published thirty-three Stangenknebel, all from the north.¹⁴⁴ A few of these, dating to the Iron Age, were found in graves. The rest were found in Terremare settlements, which were excavated when archaeological methods and standards still left much to be desired. Most of these sites lie in the Emilia-Romagna region, between Bologna and Piacenza.

Luigi Pigorini, the archaeologist most active in exploring Terremare sites, dated the cheekpieces he found in them to the Bronze Age and even to the early centuries of the second millennium BC. Gertrud Hermes, following Pigorini, believed that the Italian Stangenknebel were the earliest in all of Europe. At the other extreme Gösta Säfönd, Pigorini's hypercritic, concluded that the Stangenknebel—along with everything else from the Terremare sites—dated almost 1000 years later. Pigorini was closer to the mark than was Säfönd, and it is now generally agreed that by 1100 BC the Terremare villages no longer existed.¹⁴⁵ Although Woytowitsch did not attempt to date the cheekpieces closely, he placed them vaguely in northern Italy's Middle Bronze Age.¹⁴⁶ Hüttel explored the matter in depth. Basing his analysis on typological distinctions between the Stangenknebel from Iron Age graves and those from the Terremare sites, and on the similarity of the Terremare cheekpieces to some securely dated cheekpieces from the Carpathian basin, Hüttel concluded that the Stangenknebel spread from the basin to northeastern Italy at the end of the Bz A2 or the beginning of the Bz B period.¹⁴⁷

In addition to the cheekpieces, Woytowitsch published forty-four ornaments, made from antler, in the form of miniature spoked wheels.¹⁴⁸ Nineteenth-century archaeologists found most of the ornaments in settlements, but some were found in graves and a few can be roughly dated. Woytowitsch believed that the earliest of the figurines were made in the Middle Bronze and the latest in the Early Iron Age. The wheels of the ornaments tend to have either four or six spokes. Each wheel has a pronounced or elongated nave, its center bored through for an imaginary axle. The ornaments vary in diameter from 4 to 6 cm and the carving was done expertly, evidently by specialist craftsmen. Woytowitsch assumed that horse-drawn chariots were held in high regard in the communities where these ornaments were worn.

Quite clearly, the Terremare settlements were fairly advanced. Summarizing recent work on the Terremare culture, Cardarelli points out that although the inhabitants of these settlements depended largely on agriculture and stock-raising, they were also deeply involved in the tin bronze industry:

The abundance of bronze objects, moulds for casting and frequent traces of metalwork processes suggest the likely presence, in most villages, of a resident skilled smith. The metal arrived from distant places via a complex network of traffic which also guaranteed a supply of exotic goods, such as the amber for manufacturing ornaments used by ladies of the emerging social classes to indicate their status.¹⁴⁹

That one of the classes at Olmo di Nogara was a warrior class is suggested by yet another artifact: a small circular bronze boss. These *borchie* were found alongside many skeletons of adult males who were buried with a sword. The bronze boss, Luciano Salzani believes, may have been a decorative feature of a wooden shield, or may in some other way have been “*lo status symbol del guerriero*.”¹⁵⁰

Summary of the northern Italian evidence, and its linguistic implications

Putting together the evidence from the *borchie*, swords, spears, cheekpieces and ornamental chariot wheels, we can conclude that the militarizing of northern Italy was initiated ca. 1500 BC by men who had chariots (whether or not they made much use of them), that it began with an incursion from the Carpathian basin into the Udine-Treviso region, and that from there it spread into the Po valley (although the center may have remained in the northeast, where the amber trade dominated). A military elite, whose swords and chariots were probably more for display and intimidation than for actual combat, appears to have been at the top of society, both in the Udine-Treviso and in the Terremare region.

So much is relatively clear. The linguistic consequences of all this cannot be proven, but the implications are evident. As is well known, Latin vehicular terms—*rota* (wheel), *axis* (axle), *iugum* (yoke) and *vehiculum* itself—have Proto-Indo-European roots.¹⁵¹ Despite some skepticism about linguistic paleontology, the vehicular terms could hardly have been used in Italy before vehicles themselves were used there, and our earliest evidence for wheeled vehicles in Italy seems to come from the north in the middle of the second millennium BC. It has been suggested that much earlier evidence may come from the Val Camonica, which issues from the southern slope of the Alps and ends at the Lago d’Iseo. Along the valley are tens of thousands of rock carvings, dating from the Paleolithic period to modern times, and a dozen of the early carvings depict wheeled vehicles.¹⁵² Most of the dozen depict spoke-wheeled vehicles drawn by horses, but one carving (no. 262 in Woytowitsch’s catalogue) shows oxen pulling a wagon mounted on what are probably meant to be disk wheels. Because north of the Alps disk wheels have been found in contexts dating to the third millennium BC, it has

been suggested that no. 262 may also have been carved at that time.¹⁵³ South of the Alps, however, nothing vehicular has been found in so early a context. For no. 262 Woytowitsch suggested a date in the “mittlere bis späte Bronzezeit,” agreeing with Emmanuel Anati’s dating of the Val Camonica carvings.¹⁵⁴

Obviously the Terremare wheelwrights made spoked wheels, but the earliest *in corpore* evidence for other kinds of wheels in Italy also comes from Terremare sites: a disk wheel from Castione dei Marchesi (in the Parma province), and both a disk wheel and a cross-bar wheel from Mercurago (near Novara in the Piedmont). These three wheels were excavated in the nineteenth century and the lack of a clear stratigraphic context makes their dating problematic, but they too—like the spoked wheels—seem to have been made no earlier than the middle centuries of the second millennium BC.¹⁵⁵ On present evidence, therefore, it appears that the PIE terms for wheeled vehicles were brought into Italy ca. 1500 BC, along with the vehicles to which they were attached. I must leave to an Indo-Europeanist the question of how the Italic languages (necessarily along with Venetic) may have originated at that time, from the meeting of a military class’s Indo-European language with one or more native languages of northern Italy.

Notes

- 1 Neumann 2009, p. 102: “Fließende Gewässer nehmen in der gesamten Bronzezeit in den meisten Regionen als Niederlegungsort von Waffenden ersten Rang ein.”
- 2 On the votive deposit see Cupitò and Leonardi 2005, and Bietti Sestieri et al. 2013.
- 3 For drawing of the weapons see Cupitò and Leonardi 2005, Fig. 8.
- 4 See Curry 2016.
- 5 For his catalogue of bits in Romania see Boroffka 1998.
- 6 On the pottery see Boroffka 2013, pp. 884–888.
- 7 On the genesis of languages see Renfrew 1991 and Nettle 1998. On the extinction of languages see Nettle and Romaine 2000.
- 8 Haugen 1972, p. 257, noted that in the middle of the 19th century more than 100 Native American languages were spoken in well-watered California while only two or three major languages covered most of the arid Great Plains. “In each case it is clear that in areas where small populations could easily isolate themselves from each other and live their lives untroubled by their neighbors, they tended also in the course of time to develop their own language. This process of gradual and unconscious differentiation of language over a period of time is one of the most characteristic features of language, one which has been much studied by linguists.”
- 9 Hock and Joseph 1996 deal with language replacement especially at pp. 446–452, a chapter titled, “Language Death.” Less prestigious and less useful languages constantly give way to languages that are more prestigious or more useful. In discussing language “death,” Hock and Joseph differentiate between “suicide,” when speakers of a low-status language voluntarily abandon it, and “murder,” when authorities exert themselves to suppress or eradicate a language.
- 10 O’Brien 2015 is mostly a study of copper mines in central and western Europe, Britain and Ireland, but is also helpful (pp. 187–193) on the vast Kargaly mines of the southern Urals. See also Harding 2000, pp. 197–241, for an excellent description of the working of metals in Bronze Age Europe.
- 11 On European settlements in the Early Bronze Age see the second chapter (“The Bronze Age House and Village”), pp. 22–72 in Harding 2000.

- 12 Probst 1996.
- 13 For discussion of the dendro dates for the Leubingen grave (1940 BC) and the Helmsdorf grave (1840 BC) see Harding 2000, p. 17.
- 14 Behrendt, Küssner and Mecking 2015, p. 99, report that laboratory analysis identified twenty-two heads with tin content (between 4.5 and 7.7 percent) and a trace of silver. The authors date the settlement and the hoard to the developed Únětice culture, between 1900 and 1600 BC. For color illustrations see Curry 2012.
- 15 According to Küssner the large house, the axes, and other finds “date clearly to Bronze Age A2 and are younger than the Leubingen burial mound” (personal communication, August 8, 2012).
- 16 Nicolis 2013, p. 694.
- 17 Nicolis 2013, p. 694.
- 18 On these see Barbieri and Cavazzutti 2014.
- 19 On copper mining in the western Alps see O’Brien 2015, pp. 117–120.
- 20 Bourgarit et al. 2008.
- 21 See Bourgarit et al. 2008, p. 4: “The recent radiocarbon dating of the Vallon du Longet [smelting] site shows the highest probability between 2210 and 2130 BC.” In the mine itself large pieces of larch wood yielded dates between 2300 and 1750 BC.
- 22 Bourgarit et al. 2008, p. 9.
- 23 For a map showing the location of “rich chiefly burials” see Kristiansen and Larsson 2005, p. 121, Fig. 43.
- 24 See Czebreszuk 2007.
- 25 On the origins of the Nordic Bronze Age see Kristiansen and Larsson 2005, pp. 186–191, and Vandkilde 2014.
- 26 Sherratt 1994, p. 260.
- 27 Sherratt 1994, p. 261.
- 28 See the generalization made by Dumitrescu Bolomey and Mogoșanu 1982, p. 46, on the Carpathian-Danubian region:

Although the beginning of the Bronze Age in this area has been placed about 2000 B.C. or even earlier on the basis of analogies with the south, the most suitable date is 1900–1800 B.C., prior to which no bronze objects are known.

Dumitrescu relied especially on typological evidence because “no C-14 date is available at present for the Bronze Age cultures of Romania.” In his recent survey of the period 3000–1900 BC in Romania, Bulgaria and Moldova, a period which he calls “Early Bronze Age,” Boroffka mentions no metal objects other than gold and silver lock-rings (Boroffka 2013, p. 884).

- 29 See Becker 2000.
- 30 See Becker 2000, p. 70, Tab. 3, for the osteological evidence from Poiana-Ampoiului, a Coțofeni settlement: 685 bones from sheep and goats were found there, 226 from cattle, 226 from pigs, fifty from dogs, and only one from a horse.
- 31 See Ciugudean 1991. This article details the excavation (from 1979 to 1988) of eight very low tumuli near Ampoița, which lies almost at the center of Transylvania. Within the tumuli were forty-two inhumation burials and three cremation burials. Ciugudean dates the burials to his FBz II period, commencing with the absolute end of Coțofeni assemblages (his FBz I covers the waning of Coțofeni). Ciugudean makes no mention of bronze or of weapons in these burials, but at pp. 94–95 he reports that two gold rings were found in Grave III/1, along with a pair of spiral “eye-glasses.” The “eye-glasses” were one of only two copper items found at Ampoița. Of the Coțofeni culture Becker 2000, p. 65, says “Metallbearbeitung war noch unbedeutend.”
- 32 In surveying what preceded the Otomani-Füzesabony culture, Thomas 2008, p. 15, includes “die zahlreichen Hügelgräber, die sowohl in die Ostslowakei als auch in Ostungarn pauschal als Hinterlassenschaften eindringender pontischer Nomaden

- angesprochen werden, jedoch im Prinzip undatierbar und nur grob in diesen Zeithorizont zu stellen sind." Thomas notes without endorsement that some scholars who assume a Pontic connection for the Hungarian tumuli have called them "Pit-Grave-Kurgans."
- 33 The similarities were detailed in Machnik 1991. On the Transcaucasian parallels, and specifically on material assemblages found in Georgia, see Machnik 1991, pp. 99–100: "Die hier gefundene Keramik unterscheidet sich deutlich von der klassischen Kuro-Araks-Keramik, ist aber durch ihre Form, plastische Verzierung und Technologie den typischen Gefäßen des frühbronzezeitlichen donauländischen Kulturkomplexes täuschend ähnlich." The evidence comes especially from the settlements and kurgan graves in Georgia. Machnik's Tafel IV, on p. 100, compares 15 s.e. European and 18 south Caucasian forms. The material from Georgia, however, is conventionally dated much earlier than its parallels in Transylvania and Hungary. See also Thomas 2008, p. 350.
 - 34 On the seal-stamp *koine* extending over this part of Eurasia see Younger 2009. Younger's observations were based on *Early Stamp Seals in South-East Europe* (Budapest: Akademiai Kiado, 1984), a catalogue published by Hungarian scholar János Makkay. Younger suggested that throughout the *koine* of southeastern Europe and western Anatolia the stamps were used for impressing designs on cloth.
 - 35 On the very informative excavations at Feudvar see Metzner-Nebelsick 2013, pp. 333–334, and especially Teržan 2013, pp. 840–844. On Spišský Štvrtok see Harding 2000, p. 294, and Marková and Ilon 2013, p. 824. For initial conclusions on Fídvár in Slovakia see Jozef Bátora et al. 2012.
 - 36 Bátora et al. 2012, p. 125.
 - 37 At one cemetery, for example, thirteen graves yielded twenty-six bronze items of personal adornment. See Thomas 2008, p. 75 and Tafel 17.
 - 38 On the Füzesabony (or the eastern Hungarian and eastern Slovakian) aspect of this see now Thomas 2008.
 - 39 Kristiansen and Larsson 2005, p. 125. These authors (see their discussion of chronology on pp. 116–118) accept the carbon dating of 1628 BC for the Thera eruption, and their chronology is therefore a century higher than the chronology that I am following.
 - 40 See Rotea et al. 2008. See also the same authors' introductory statement at p. 7: "During the Bronze Age, Transylvania was the most prolific metallurgical center throughout temperate Europe both in terms of production and creation." I have not found reference to the Transylvanian mines in O'Brien 2015, and they do not appear in his map (at Fig. 1.10, p. 33) showing distribution of known copper mining sites in prehistoric Europe.
 - 41 Fischl et al. 2013, p. 363.
 - 42 Dietrich 2011.
 - 43 Metzner-Nebelsick 2013, pp. 336–337:

Gezäumte Pferde als Reittier oder als Wagengespann bietet ähnlich wie das Schwert eine Projektionsfläche von Habitus-konzepten kompetitiver Kriegereliten und es mag kaum verwundern, dass gerade die Knebel des Zaumzeugs als Bildträger der viel zitierten Adaptionen eines ursprünglich mit dem schachtgräberzeitlichen Griechenland verbundenen Repräsentationsstil der Wellenbandornamentik assoziiert sind.
 - 44 Kuznetsov 2006.
 - 45 Bobomullov 1997; Parpola 2004–2005, p. 4.
 - 46 For his dissertation at Heidelberg University, under the direction of Vladimir Milošić, Hüttel catalogued, classified and illustrated all of the known Bronze Age bits from this region. Hüttel's dissertation, finished in December of 1974, came to the attention of Hermann Müller-Karpe, editor of the prestigious *Prähistorische Bronzefunde*

series. That series is divided into sections (*Abteilungen*) and Abteilung XVI is set aside for the bronze pieces of horse-harness (*Pferdegeschirrteile*). The first volume in this Abteilung was Friedrich-Wilhelm Hase's, *Die Trensen der Früheisenzeit in Italien* (Munich: Beck, 1969), a slim volume of 63 pages, with 23 Tafeln. Hüttel's dissertation was more substantial, and while most of the Iron Age bits that Hase catalogued were indeed made of bronze, most of the Bronze Age bits with which Hüttel dealt were organic rather than metal. Müller-Karpe nevertheless decided that Hüttel's work deserved publication in his series, and the work—revised and enlarged in the late 1970s—appeared in 1981 as *Bronzezeitliche Trensen in Mittel- und Osteuropa* (*Prähistorische Bronzefunde* Abteilung XVI, Band 2).

47 On the consumption of horsemeat in the Carpathian basin in the Neolithic period see Drews 2004, p. 12.

48 Hüttel 1982, p. 41:

Dies gilt auch für die Bewaffnung wie Rapiert und Vollgriffschwert, gilt ebenso für die "Akropolen" als dem danubischen Äquivalent palatial-zentralörtlicher Organisationsformen der Ägäis oder des Vorderen Orients, die zum einen die sozioökonomisch notwendige Grundlage der Streitwagenentwicklung bilden, zum anderen der natürliche Soziotop des "Streitwagentums" als einer elitären Lebensform sind.

49 Hüttel 1994, p. 208, noted "dass gleichzeitig mit der Stangenknebeltrense neue Waffen aufkommen."

50 Feldman and Sauvage 2010, especially pp. 95–119 and pp. 132–140.

51 Boroffka 2004, Abb. 12. At p. 351 Boroffka calls this depiction "die einzige bisher bekannte bildliche Darstellung eines Wagens aus dem Karpatenbecken."

52 Boroffka 2004, Abb. 10–11.

53 Hüttel 1981, p. 179: "Die frühesten Bronzetrensen in Mitteleuropa begegnen mit Beginn der Jungbronzezeit im 13. Jahrhundert."

54 Hüttel 1981, Tafeln 2 and 3.

55 Hüttel 1981, Tafel 26A shows the distribution of *Scheibenknebel* included in Hüttel's catalogue. For a more recent survey see Priakhin and Besedin 1999.

56 For drawings of the thirteen Anatolian organic bits, all but one of them *Stangenknebel*, see Hüttel 1981, Tafel 42; these cheekpieces are not included in his catalogue.

57 For the map see Hüttel 1981, Tafel 26B. Find-spots of the thirty-three north Italian cheekpieces, all of them *Stangenknebel*, are not included on the map, but these cheekpieces are dealt with at pp. 182–186 and are pictured at Tafeln 39–41. At p. 183 Hüttel describes the Italian *Stangenknebel* "als Filiation der donauländischen Trensenentwicklung der Altbronzezeit." For some of them almost nothing is known other than their *Fundort*, but Hüttel concludes that the latest belong to the Iron Age and that the very earliest of them date from the end of the Bz A2 and the beginning of the Bz B period.

58 See Hüttel 1981, Tafel 26B.

59 Boroffka 1998, p. 87: "Die Funde von Cetea dürften aus einer Werkstatt zur Knochen- und Geweihbearbeitung stammen, die der Wietenburg-Kultur zugeordnet werden kann." The Wietenburg culture in Romania parallels the Otomani, and is dated to the Bz A2 period.

60 See, for example, Hüttel 1981, p. 171 and Hüttel 1994, p. 207.

61 Boroffka 1998, p. 103:

Die ältesten Trensenknebel aus klaren Kontexten können in die Zeit der Stufe Frühdanubisch (FD) III (Reinecke A2) gestellt werden. Es handelt sich dabei um Exemplare von Stangenknebeln der Varianten Ia, Ib, Ic, IIa, und IVb4. Fast alle Scheibenknebel beider Typen (A und B) können in die Zeit der Stufen FD III bis Mitteldanubisch (MD) 1/II eingeordnet werden.

- 62 Boroffka 1998, p. 116:

Im Karpatenbecken sind leichte Streitwagen nicht direct zu belegen. Es ist jedoch durch die Scheibenknebel östlicher Art wahrscheinlich, dass solche Fahrzeuge vorhanden waren. Scheiben- und Stangenknebel sind archäologisch im Karpatenbecken und im Gebiet des südlichen Ural etwa gleichzeitig, spätestens im 19. Jh. v. Chr., zu fassen.

- 63 On this see Hermes 1937, pp. 113–116: “Die europäischen Indogermanen als Reitervölker.”

- 64 See Hüttel 1994, p. 209: The “Verreiterung” of the steppe peoples began not with the Kimmerians and Scythians, but was a long process,

der nach meiner Auffassung bereits im 17./16.Jh. mit der allmählichen Militarisierung des Reitens im mittleren Donaauraum beginnt. Dieser in der frühen Bronzezeit initiierte und möglicherweise von der Streitwagenbewegung stimulierte Prozess setzt sich in der späten Bronze- und frühen Eisenzeit wie in einer Kettenreaktion fort.

- 65 See Hüttel 1981, p. 21: “Alle Fakten zusammengenommen, erscheint uns die Deutung der sechs fraglichen Geweihstücke von Dereivka als Trensenknebel durchaus begründet und möglich.”

- 66 For chariots in Scandinavian rock carvings see Johannsen 2010. For scenes of combat in rock carvings or bronze engravings from Bronze Age Europe see Thorpe 2013, pp. 238–239.

- 67 On the find-spots of the *Stangenknebel* see Hüttel 1981, p. 175. On the rise and decline of the tell-settlements see Metzner-Nebelsick 2013, pp. 332–336.

- 68 Bader 1991, p. 3.

- 69 Bader 1991, nos. 9–19. No. 10 was included in a founder’s hoard of 240 bronze objects, deposited in Bz D (13th century BC).

- 70 Bader 1991, p. 28: “Also sollten unsere Exemplare etwas jünger sein als diejenigen der Schachtgräberzeit.”

- 71 On these early rapiers see Bader 1991, p. 2, echoing a description given by Peter Schauer 20 years earlier:

Der Griff aus organischem Material (Holz, Horn, Knochen) hat sich im allgemeinen nicht erhalten. In einigen Fällen kann man den Heftausschnitt in der Patina erkennen. Der Griff wurde vermutlich aus einem Stück hergestellt, wobei die Griffplatte in den Heftteil des Griffes eingeführt und mit Nieten befestigt wurde.

- 72 David 2002, pp. 910–911

- 73 Bader 1991, p. 51.

- 74 In Bader’s catalogue the eleven Type A rapiers from Romania are followed by two Type B swords (nos. 20 and 21) and by one Type C (no. 22), both types shorter and more securely hilted than the Type A, but still rapiers. These may have been imports from the Aegean, where they were relatively numerous, and they had no successors in the Carpathian basin. The Romanian Vollgriffschwerter from the Early and Middle Bronze Age are nos. 25–33 in Bader’s catalogue, and those from the Late Bronze Age are nos. 312–382. Kemenczei 1991 is devoted entirely to the more than 400 Vollgriffschwerter from Hungary. From the erstwhile Yugoslavia (mostly Serbia) Harding 1995 adds another 44 (nos. 228–271).

- 75 Pearce 2013.

- 76 Cowen 1961 and Cowen 1966.

- 77 On the longevity of the cut-and-thrust *Griffzungenschwert* see Snodgrass 1964, p. 106.

- 78 Vulpe 1970, nos. 293–570. For find-spots see his Tafeln 50–53.

79 Vulpe 1970, p. 69.

80 See Fig. 1 in Furmánek, Mišík, and Tóth 2013.

81 For the Iorcani axe see Tencariu et al. 2014. The axe was discovered by a farmer in the early 1950s and for years saw service as a household tool, which obscured some of the decoration. In 2012 it was donated to the local museum and there came to the attention of Felix-Adrian Tencariu and his colleagues. The discoverer's family recalled that the axe had been found between two springs at the base of the Iorcani Hill. At p. 126 Tencariu et al. speculate that it had been placed between the springs as a votive deposit.

82 Osgood, in Osgood and Monks 2000, p. 78 and Harding 2007, pp. 78–79, believe that the axe was seldom used as a weapon in Bronze Age Europe.

83 Tencariu et al. 2014, p. 129.

84 Thomas 2008, p. 15: In addition to the novel fascination with Wellenband decoration and curvilinear incision,

ist auch das Erscheinen charakteristischer Hortfunde mit prunkvoll im Spiralstil verziert und qualitativ sehr hochwertigen Waffen bisher unbekannten Typs (Kurzschwerter, Lanzen), ausserdem das Errichten schwer befestigter, fast städtischer Siedlungen mit Lehmziegelmauern und rechtwinklig angelegtem Strassennetz, die als Sitz der Bronzemetallurgie und zugleich als Sitz einer neu herausgebildeten gesellschaftlichen Oberschicht dienen.

85 See Leshtakov 2011, p. 46: “The previously mentioned mould from Feudvar in Serbia shows that the idea for such spearheads can be traced back to the EBA/MBA transition according to the central European relative chronology (Vasic 2001, 96) or approximately 18th–16th- centuries BC.” See also Teržan 2013, p. 844.

86 Říhovský 1996, p. 11, had doubts about the copper object (Nr. 88) from Holešov in northeastern Moravia. “Die älteste sichere Lanzenspitze im Arbeitsgebiet ist also erst in der *jüngeren Phase der Altbronzezeit* in der klassischen bis späten Stufe der Aunjetitzer Kultur zu verzeichnen (Nr. 1).” The italics are Říhovský's.

87 Harding 2007, pp. 77–78.

88 Leshtakov 2011.

89 Říhovský 1996, p. 1.

90 Mödlinger et al. 2013, p. 22.

91 On the Ha A1 dates of these six shields see Uckelmann 2012, pp. 19–20. See also Uckelmann 2011a, p. 190:

The Type Lommelev-Nýrtura includes only one complete shield from the eponymous find site of Lommelev Mose on Falster, Denmark (Fig. 2) and fragments of shields from five hoards located in the Carpathian Basin. These finds have a central role in the dating of the shields, because they can be dated through their associated finds to the earlier Urnfield period (*ältere Urnenfelderzeit*, Bz D / Ha A1) or the 13th century BC, which makes them the oldest bronze shields so far in Europe.

92 Uckelmann 2011a, p. 197.

93 Dickinson 1999b, p. 102, argues otherwise:

Further, I find this whole notion that a relatively small group would have been able to impose themselves as rulers over a considerably larger population, in the conditions of the ancient world, hard to swallow.

But this happened often in the ancient world, even in places where militarism was long established. As Dickinson knows better than I do, the Romans conquered half of Britain—where inter-tribal warfare had not been uncommon—with only four legions and auxiliaries. Conquest of a population that was essentially demilitarized—or

- in some instances “unmilitarized”—was possible with much smaller forces. The Babylonian Chronicle, the Cyrus Cylinder and Greek sources agree that in 539 BC, after Cyrus defeated Nabonidus’ army at Opis, the Persian troops entered Babylon without a battle and Cyrus took over the Neo-Babylonian empire with its several million inhabitants. Two hundred years later Alexander’s army that put an end to the Persian empire took over a population 100 times its size. The Arabian armies that took over Mesopotamia, the Levant and Egypt in the 7th century seldom exceeded 25,000 men.
- 94 See the website at www.ibtimes.co.uk/poland-3600-year-old-cemetery-reveals-life-tumulus-warrior-community-1550380, accessed January 19, 2017.
- 95 Vandkilde 2014, Fig. 5.
- 96 For a map showing distribution of Apa swords in the Carpathian basin and in northern Europe see Metzner-Nebelsick 2013, Abb. 1. For the two Nebra swords see Hansen 2010.
- 97 See Wincentz Rasmussen and Boas 2006; see also Horn 2013a.
- 98 On the contemporaneity of the northern with the Carpathian swords see Bader 1991, p. 51: “Die Gleichzeitigkeit der karpätenländischen und der nordischen Vollgriffschwerter vom Typ Apa ist sehr wahrscheinlich.” See Vandkilde 2014, pp. 605–606 for discussion of chronology of the NBA (Nordic Bronze Age) IA and IB and links to Nebra and the Carpathian basin.
- 99 See Vandkilde 2014, p. 603: “The argument will be presented that Carpathian connections commenced on a smaller scale in NBA IA c. 1700–1600 BC, but were particularly lively, influential and culturally formative in NBA IB c. 1600–1500 BC.” Vandkilde’s chronology is about a century higher than mine, since she accepts the 1628 BC date for the Thera eruption.
- 100 Vandkilde 2014, p. 623:

The emergence of the NBA as a cultural zone in and of itself was historically linked with the Carpathian crossroad, particularly during the period with Koszider metalwork (Table 1). This could in turn mean a longer chain of linked socio-cultural change starting in the Aegean. Indeed, similar warrior gear with swirling cosmology-embedded designs embellishes the pinnacles of the material hierarchies across Europe with highlights in southern Scandinavia, the Carpathian Basin, and the Aegean. A widely shared Indo-European background may have facilitated a generally high degree of receptivity across Europe at this time.

- 101 See Cowen 1961, Fig. 5 for distribution of the Sprockhoff Ia swords.
- 102 Horn 2013a, p. 20.
- 103 Vandkilde 2014, p. 611.
- 104 See Christensen 1972, p. 161: “Quite a lot of log boats have been found all over Scandinavia, but nearly all are just plain ‘dug-outs’ and offer little help in explaining the transition from a one-piece boat to one fashioned from many pieces of wood.”
- 105 Ling 2014, p. 63:

A majority of these items are well dated from their contexts, mainly graves from the LBA, period IV-V. . . . There are considerably fewer bronze items with ship renderings from the EBA, so far only two, namely the Rørby sword, dated to period Ib . . . , and the famous Wismar horn.

- 106 Oxford: Oxbow Books, 2014.
- 107 Ling 2014, p. 1.
- 108 Harding and Hughes-Brock 1974.
- 109 Kristiansen and Larsson 2005, p. 206, Fig. 92. See also their comments at p. 207:

There is also the strange rock carving of ships outside an early tholos from the late Middle Helladic/early Late Helladic (Wachsmann 1998: Fig. 7.30–31).

It represents a foreign Nordic tradition of rock carving which suggests a Nordic chief or artisan, rather than local graffiti. Also, the famous Rørby sword and the early ship iconography in Scandinavia not only resemble the Minoan ship type, but the iconographic representation with the dotted lines is paralleled in late Middle Helladic pottery (Fig. 92). It is impossible to understand the Rørby ship without these Mediterranean prototypes.

- 110 Kristiansen and Larsson 2005, p. 208.
- 111 On the chariot carvings see Johannsen 2010.
- 112 Johannsen 2010, pp. 166–175. These are the vehicles of Groups A and B in Johannsen's typology.
- 113 Johannsen, 2010, p. 177, Fig. 12.
- 114 Johannsen 2010, p. 182.
- 115 Johannsen 2010, p. 161, dates it "around 1400 BC, e.g. Period II." Johannsen also mentions two miniature bronze stallions included in a hoard from Period II found at Helsingborg, Scania.
- 116 Randsborg 1991, and Randsborg 2010, pp. 251–254.
- 117 See Randsborg 2010, p. 251: "The debate is over whether the artefacts are functionally usable or merely symbolic editions of otherwise wooden items."
- 118 Hüttel 1981, p. 103.
- 119 Johannsen 2010, p. 160:

Similar, but unornamented, rod-shaped cheek pieces are known from Emb in Jutland, and according to Sara H. Jensen there are several unpublished rod-shaped cheek pieces made of organic material in the collections of Danish museums (Sara H. Jensen, pers. comm. 2009).

- 120 Harding and Hughes-Brock 1974, p. 153.
- 121 Nicolis 2013, p. 694.
- 122 Cardarelli 2009, p. 456.
- 123 Cardarelli 2009, p. 450.
- 124 Bianco Peroni 1970. This was the first volume of Abteilung IV, the section of the *Prähistorische Bronzefunde* series devoted to swords.
- 125 On the important Olmo di Nogara site see Salzani 2005. On the votive deposit in the Tartaro see Bietti Sestieri et al. 2013.
- 126 Salzani 2005, p. 538.
- 127 Salzani 2005, p. 537.
- 128 Salzani 2005, p. 298: "Naturalmente, la spade è presente sempre in tombe di individui maschili, di età adulta o anziana."
- 129 Schauer 1971, pp. 21–22: "Es ist erstaunlich, wie wenig haltbar die Sauerbrunn-Schwertklingen mit dem Griff aus organischem Material verbunden waren. Der Erhaltungszustand lässt vermuten, dass die Nieten bei kräftig geführten Stößen oder Rapierschlägen ausrissen."
- 130 Bianco Peroni 1970, p. 13: The seven Sauerbrunn swords (Nrs. 1–7) seem to date "ad una fase iniziale della media età del bronzo italiana, corrispondente grosso modo alla fase Bronzo B 1 dell'Europa Centrale."
- 131 Kemenczei 1988, nos. 1–63. See also no. 149, which is a Sauerbrunn from Keszthely (although Kemenczei tends not to use the term "Sauerbrunn").
- 132 See Kemenczei 1988, pp. 8–9. His nos. 1–2 are copper daggers, dating from the *Kupferzeit*. Nos. 3–5 (and possibly nos. 3–12) are bronze daggers dating "an den Beginn der ungarischen Bronzezeit."
- 133 See Neumann 2009, Abb. 1 for the five-stage evolution from the Sauerbrunn to the Boiu IIb.
- 134 Cowen 1961, p. 208.

- 135 See the map at Neumann 2009, Abb. 4, showing find-spots of the Sauerbrunn and Boiu-Keszthely swords (including the nineteen found at Olmo di Nogara).
- 136 Foltiny 1964, p. 249.
- 137 Foltiny 1964, p. 250.
- 138 See Neumann 2009, p. 106: “Die Schwerter mit voll entwickelter Griffzunge vom Typ Boiu IIb-c und die Ziergruppe 2 können dann schwerpunktmässig in Bz C2 gesetzt werden.”
- 139 Foltiny 1964, pp. 251–252.
- 140 Jung and Mehofer 2005–2006, p. 126, discuss a Cetona type sword from Olmo di Nogara and conclude that “not only chronologically, but also typologically it stands at the beginning of Naue II sword production on the Appennine peninsula.”
- 141 Bietti Sestieri et al. 2013, p. 162.
- 142 Toms 2000, p. 101.
- 143 Toms 2000, Fig. 5.6.
- 144 Woytowitsch 1978, pp. 117–119; see his Tafeln 52–54 for drawings of the Italian Stangenknebel, most of which are undecorated. See also Hüttel 1981, pp. 182–186, “Anhang II: Bronzezeitliche Geweihtrensenknebel in Italien,” and his Tafeln 39–41.
- 145 On this see Pearce 1998. Pigorini saw similarities between Terremare and Hungarian artifacts and attributed them to a migration of Indo-Europeans into Italy from central Europe. Pigorini’s “Terremare theory” stood up fairly well until the publication of Säflund’s *Le Terremare* in 1939. Pearce remarks that although Säflund “rubbed Pigorini comprehensively,” research since the Second World War has tended to rehabilitate Pigorini’s work.
- 146 Woytowitsch 1978, p. 117: “Trensenknebel aus Holz, Knochen oder Hirschgeweih können nur annähernd in die mittlere Bronzezeit datiert werden.”
- 147 Hüttel 1981, pp. 183–184.
- 148 Woytowitsch 1978, Anhang II (pp. 111–116), “Schmuckräder” with Tafeln 50–51.
- 149 Cardarelli 2009, p. 452.
- 150 Salzani 2005, p. 299.
- 151 Well covered in Meid 1994, pp. 58–62. Anthony 2007, pp. 33–36, has a good discussion of **k^wek^wlos* and **rot-eh*, the two PIE words for “wheel.”
- 152 In Woytowitsch 1978 these are nos. 261–272.
- 153 Crouwel 2012, p. 100, suggests a date in the 3rd millennium BC.
- 154 Woytowitsch 1978, p. 103, with reference to Anati’s *Camonica Valley; A Depiction of Village Life in the Alps from Neolithic Times to the Birth of Christ, as Revealed by Thousands of Newly Found Rock Carvings* (New York: Knopf, 1961), pp. 50 and 114.
- 155 In Woytowitsch 1978, the disk wheels are nos. 1 and 2, and the cross-bar wheel is no. 3. As a date for the Mercurago cross-bar wheel Woytowitsch suggested (p. 29) “vermutlich Spätbronzezeit/Früheisenzeit.” Woytowitsch noted (p. 27) that amber was reported from the same level as the Castione dei Marchesi disk wheel. On the basis of similarities to disk wheels north of the Alps he suggested a date “zwischen älterer und mittlerer Bronzezeit.” Crouwel 2012, p. 101, agreed that “[t]he first *material* remains of carts or wagons in Italy consist of single wheels of the disk and cross-bar types which survived from lake sites of the Terramara culture. They date from the Middle and Late Bronze Age (c. 1700–1000).” See also Harding 2000, p. 165.

6 The beginning of militarism in Greece

A hundred years ago, in the wake of Evans' discovery of the "Minoan" culture at Knossos, several archaeologists suggested that "the Greeks" did not arrive in Greece until after the great palaces had been built on Crete. Wilhelm Dörpfeld believed that the culture found on Crete was the work of Carians, and that only with the Shaft Graves at Mycenae could one begin to see a Greek presence in the Aegean.¹ Studying the origins of Greek mythology, Martin Nilsson seconded the archaeologists' suggestion and placed "the coming of the Greeks" at the end of the Middle Helladic period.² In 1970 William Wyatt advanced a much more robust argument, based on linguistics: the people whose language evolved into Greek could hardly have arrived in Greece before the end of the Middle Helladic period, because they brought with them their Indo-European terminology for chariots and their components.³ Persuaded that this conclusion was correct, and fortified by the recent (in 1988) identification of the "mysterious" bone objects from Shaft Grave IV as cheekpieces for organic bits,⁴ I argued that the newcomers were able to take over parts of Greece precisely because they had military chariots, chariots having introduced a new kind of warfare (although how new it was, I greatly underestimated).

Since the late 1920s the majority view among archaeologists has been that "the Greeks" arrived in Greece no later than the end of EH III and probably well before that, in either case long before chariot warfare began. For a long time the preferred date for "the coming of the Greeks," was ca. 1900 BC, the beginning of the Middle Helladic period, because it seemed that Minyan ware first appeared at that time. When it became clear that the Minyan ware of the MH period had evolved from pottery in use during the EH III period, "the coming of the Greeks" was raised to ca. 2200 BC, the transition from EH II to EH III. Widespread destruction at the end of EH II was proposed by John Caskey, who in the 1950s had found it (along with antecedents of Minyan ware) at Lerna, and Caskey associated the destruction with the arrival of a new population. When a closer examination of the EH II/III transition concluded that destruction at the end of EH II was visible at relatively few sites, the case for "the coming of the Greeks" ca. 2200 BC was weakened.⁵ In response, an argument was made—on other archaeological grounds—that the Greeks arrived in Greece almost 1000 years earlier, at the beginning of EH I.⁶

The various arguments from pottery and artifactual innovations do not confront the single linguistic argument, which now is considerably stronger than it was when

Wyatt first formulated it. Because the Greek language inherited PIE terms for a vehicle (ὄχος), for a wheel (κύκλος), for an axle (ἄξων), and for a yoke (ζυγόν), the speakers of what became the Greek language must have known the wheeled vehicle when they arrived in Greece, and thereafter both the various objects and the terms used to denote them must have been “constantly and continuously known” to the speakers of that language.⁷ It is true, as critics objected, that the vehicular terms are not specific to chariots and could have been applied to wheeled vehicles of any kind. As Joost Crouwel’s exhaustive review of the evidence makes very clear, however, it is also true that nowhere in Greece—just as nowhere in Egypt, and nowhere in Italy—is there evidence for wheeled vehicles of any kind before the seventeenth century BC, when chariots suddenly appeared.⁸ In the Near East, on the steppe, and in temperate Europe disk-wheeled wagons and carts were in use already in the last centuries of the fourth millennium BC. Another millennium and a half seem to have passed before wheeled vehicles finally were brought—in the form of chariots—to Egypt, to Italy and to Greece. In the wider Aegean we have a single earlier representation of a wheeled vehicle: the clay model of a wagon found at Palaikastro, in eastern Crete, and dated roughly in the MM I period.⁹ The absence of evidence for wheeled vehicles on the Greek mainland prior to ca. 1600 BC is in sharp contrast not only to the steppe, where so many wagons have been found under Early and Middle Bronze Age kurgans, but also to temperate Europe. In the Carpathian basin alone dozens of clay models of wagons have been found in Chalcolithic and Early Bronze Age contexts.¹⁰

Despite the linguistic argument, or perhaps because it has not been stated clearly enough, the belief persists that what was to become the Greek language came unobtrusively to Greece no later than the EH period. Most Aegean archaeologists still defend that position, resisting any intrusion by outsiders, but the assault builds. Silvia Penner has made a good case that toward the end of the MH period charioteers from the steppe conquered parts of Greece, and Anthony Harding—looking closely at the horse harness—has taken a long step toward the same conclusion. Most recently the excavations at Mitrou have given more evidence of a military (and charioteering) elite in Greece in the LH I period.¹¹ In this chapter I will make an argument—more compelling, I hope, than the one I made 30 years ago—that at the beginning of the Shaft Grave period a military force equipped with chariots came from a faraway land and took over the most attractive parts of Greece.

The new militarism

Before militarism came to southern Scandinavia and northern Italy, and at about the same time that it came to the Carpathian basin, it came also to parts of the Greek mainland. What happened on the Greek mainland shortly before 1600 BC has recently been summarized by Hélène Whittaker:

Toward the end of the Middle Helladic period we see a fundamental break with the values of Middle Helladic society. There is an opening up to

influences from the wider world, and the presence of rich and exotic grave goods indicates that wealth and conspicuous consumption were starting to become important to the expression and reinforcement of social and political status. In particular, using material culture to advertise contacts with the Minoan elites became a new way for members of the emerging Mycenaean elites to show how rich and powerful they were. In the political sphere, we see the development of a powerful military culture that was expressed through the material elaboration of the lifestyle of the warrior.¹²

I will argue that this was indeed a fundamental break rather than a development: the military culture, that is, was the result not of a process but of an event, a sudden interruption of the *longue durée* on the Greek mainland.¹³

Through most of the Middle Helladic period the Greek mainland had resembled, if we may answer Oliver Dickinson's question in the affirmative, a "third-world" country when compared to Middle Kingdom Egypt or Minoan Crete.¹⁴ The material remains from Greece show no sign of a formal state, a ranked society, or anything other than a simple village economy. Parts of the mainland, especially if they had important natural resources, were apparently under the control of the ruler at Knossos.

Two hundred years later, ca. 1400 BC, the Greek mainland was home to one of the most important kingdoms in western Eurasia. Knossos and the rest of Crete were now under the control of this mainland kingdom, which was also embarking on expeditions to western Anatolia and Cyprus. Evidence for this kingdom comes from Hittite texts, which complain of trouble from what was originally written as Ahhiya, and later as Ahhiyawa.¹⁵ Ahhiya, or Achaea, was apparently the name that in the middle of the second millennium BC western Anatolians applied to the land mass that mariners encountered when sailing west from the Dardanelles. The land mass began at the Vardar river (called the Axios by the Classical Greeks) and ran south to the tip of Lakonia in the Peloponnesos. Of course the rulers about whom the Hittite kings were concerned, and with whom they were occasionally in correspondence, did not rule more than a fraction of this Ahhiya. A Great Kingdom was evidently centered at Mycenae, and its authority seems to have extended through most of the Peloponnesos and through central Greece so far to the west as—but not beyond—the Pindus range.

Ca. 1400 BC the Hittite king Arnuwanda I, in a tablet that Hittitologists call the "Indictment of Madduwatta," reminded Madduwatta (whose small kingdom lay somewhere in western Anatolia) of the time that Attarissiya, "the man of Ahhiya," led his army against Madduwatta and would have prevailed had not the Great King of Hatti sent an army to rescue his vassal and restore him to his kingdom.¹⁶ Further on in the same tablet Arnuwanda accuses Madduwatta of collaborating with Attarissiya in raids on Alashiya (Cyprus).¹⁷ It is barely possible that the Atreus of Greek legend was a dim recollection of Attarissiya. The tablet in which Attarissiya appears is the first of at least twenty-six Hittite tablets that refer to Ahhiya/Ahhiyawa. The rulers in Achaea, in order to have merited the title of "Great King" and of "Brother" to the Great King of Hatti, must have had a network of vassal

kingdoms,¹⁸ and for a time the network seems to have included Miletos (Milawata or Milawanda) and Troy (Wilusa) on the Anatolian coast.¹⁹

The creation of a Great Kingdom on the Greek mainland must by definition have been preceded by the establishment of one or more small kingdoms or chiefdoms. The earliest evidence for anything of the sort on the mainland comes from shortly before 1600 BC: impressive burials in shaft graves, chamber tombs, and tholos tombs include not only very rich grave goods but also an array of weapons and evidence for chariots. The most likely explanation for the sudden appearance of a ranked society and militarism is that shortly before 1600 BC there arrived in the harbors of the Greek mainland military forces and their leaders. The linguistic argument about wheeled vehicles identifies the language of the intruders as Indo-European.

What was militarized

On the Greek mainland were some of the same attractions that brought militarism, and very likely new languages, to other parts of Europe. The primary attractions on the Greek mainland were hardly the fertile plains of Thessaly and elsewhere, as I naively supposed 30 years ago, but something more negotiable. The plains would attract attention later, but the initial attractions were apparently copper and silver from the Laurion mines, along with whatever else on the mainland was enriching Knossos and the other palaces on Crete. We need not imagine a single military force appropriating all the best parts of the Greek mainland. Word of a first expedition's success may—within a few years—have inspired a second and then a third company of military men to go out into the world and seek their fortune.

Because of the mines, the eastern coast of Attika was probably taken over immediately. The principal sites in eastern Attika were Thorikos and Marathon (Vrana), where impressive tholos and tumulus burials have been excavated. Thorikos was immediately to the north of the Laurion mines. Although Marathon was 50 km further to the north, it overlooked a fine harbor in Marathon bay. Other sites that were occupied late in the MH or early in the LH period included Brauron and—along the Boiotian and Lokrian coasts—Aulis, Dramesi and Mitrou. For control of the road along Attika's opposite coast, leading from the mines to the acropolis of Athens and to the harbor of Eleusis, the new rulers built a strongly fortified settlement on the lowest terrace of the elevated site often called Kiapha Thiti (alternatively, Kontra Gkliate). An early settlement on this high hill had been abandoned after the EH II period, and the hill had been uninhabited for half a millennium until late in the MH III period. It was then that the fortification wall, some 160 m long, was constructed.²⁰

Prime desiderata were harbors from which to market either raw materials or products made from them. One of the best anchorages in eastern Greece was the Nafplio harbor on the Argolic gulf, thanks to which Lerna had become the most impressive town of Early Helladic Greece. The newcomers took possession of the Nafplio and Asine harbors and then the interior of the Argolid. An important site

was Tiryns, a hill 2 km from the innermost recess of the gulf. Other Argolid sites were further inland, among them Midea, Dendra and Mycenae.

In the plains, the objectives were towns or villages situated on commanding heights. The acropolis at Athens was such a site. In Boiotia, the low hill known in historical times as the Kadmeia lay between two valleys. It had been the site of a town, possibly fortified, in the EH II period and was again well populated late in the MH period. The intruders took over the town and probably conferred upon it the name "Thebes."²¹ In the Eurotas valley of Lakonia sites such as the high Vapheio hill and—most recently identified—the Agios Vassilios hill (some 12 km south of Sparta) fell under control of the newcomers.²²

Not long after the first military men came to Greece—here the evidence comes from tholos tombs—others seem to have found it profitable to take control of the Bay of Navarino on the southwestern tip of the Peloponnesos.²³ Tholoi also show that early in the LH period other harbors on the coast of Messenia and Elis were prosperous and prominent. Peristeria lies 40 and Kakovatos 70 km north of the Bay of Navarino. Louise Schofield suggests that Peristeria,

rivalled and perhaps even outshone Pylos in the Shaft Grave Era, with a fortification wall and a large building dating back to the sixteenth century. Three tholos tombs associated with the settlement date to the Shaft Grave Era and further demonstrate the importance of the site at that time.²⁴

In Tomb 3 at Peristeria, dating to the LH I period, archaeologists found three gold cups along with fragments of gold ornaments. There are no gold mines in the Peloponnesos, and the gold must have come to Peristeria in exchange for something else.

The prosperity of these western harbors seems to have depended in part on amber that arrived via the Adriatic from northern Europe. The survey of amber in prehistoric Greece done by Anthony Harding and Helen Hughes-Brock found that "there is no certain evidence for amber before the LBA in Greece and few reliable attestations elsewhere" in the Mediterranean and the Near East.²⁵ With the beginning of the LBA, however, a great deal of amber began to come into Greece and to a few other places. Archaeologists found it especially in the graves at Mycenae: Grave Omikron in Circle B held 122 amber beads, and IV in Circle A a staggering 1290. Close behind the Argolid was the Messenian coast, which was apparently more important in the amber trade during LH I and LH II than it was in LH III.²⁶ Referring to Renfrew's *Emergence of Civilisation*, Harding and Hughes-Brock noted that:

Renfrew makes the interesting suggestion that amber at this period reached the Mycenaean kings by means of a 'prestige chain' of gift-exchange stretching across Europe, of which they formed the final link. How and why such a chain should have come into action so suddenly and worked for such a relatively short time would add yet another puzzle to the Shaft Grave era.²⁷

Horses and chariots

It is argued here that the arrival of militarism on the Greek mainland was an event, or a short series of events, at the center of which were military chariots. Archaeologists intent on continuity and evolution are loathe to accept such a conclusion. Oliver Dickinson, who has for decades been expert *sans pareil* on the Aegean Bronze Age, conceded that in the LH period horses were used to pull the palaces' chariots.

But this association with the chariot was established long after the horse's first appearance in the Aegean, which must be firmly separated from the dramatic 'Indo-European' overtones that it used to have; its introduction is in fact unlikely to have had any appreciable social or economic effects.²⁸

The earliest horse bones (excluding those from Pleistocene times) reported from Greece come from EH III Tiryns: among the many bones found in dumps on the Tiryns citadel were three identified as coming from an *Equus caballus*. Either the three bones were misidentified or some Tirynthians had gone to a great deal of trouble to import a horse for butchering.²⁹ Tamed horses appeared in Greece only in the MH period. Although a few may from time to time have been ridden, their normal function was to pull chariots or other spoke-wheeled carts. In the first half of the second millennium BC, in fact, tamed horses can seldom be separated from spoke-wheeled carts. Late in the MM II period a ruler on Crete may have employed a few military chariot crews and may even have purchased—as several Near Eastern kings had done—one or more chariots and trained horses for his own recreation and display. Such harbingers would in themselves have been of no historic importance, but there are indications that toward the end of the MM/MH period chariots came in numbers, as part of a military force that initiated the transformation of Greece.

On the assumption that the inhabitants of MH Greece had a military tradition (and a military organization?), Dickinson argued that even if chariots were brought in by an invading force they would have made little difference in battle, because mainland commanders would quickly have found a way to counter them, just as the Romans were quick to neutralize Pyrrhus's elephants.³⁰ But we have no reason to think that the inhabitants of MH Greece had any commanders, any military tradition, any resemblance to the Romans of the third century BC, or indeed had ever fought a battle. They are likely to have submitted at the very sight of chariots and a military force.

Apparently horses and chariots came to the Troad at about the same time that they came to the Greek mainland. Troy II, a rich fortress-city, had been destroyed ca. 2200 BC and for the next 500 years—through the strata of Troy III, IV and V—the site was undistinguished. Then the imposing Troy VI was built, and it would remain a dominant city in northwest Anatolia through most of the Late Bronze Age. The building of Troy VI is often dated ca. 1700 BC, and that or an even earlier date would be correct if the Thera volcano did indeed erupt ca. 1628 BC.

On the historical chronology used in this book, however, Troy VI was built closer to 1600 than to 1700 BC. Manfred Korfmann's excavations of the lower city found that Troy V, the immediate predecessor of VI, was still standing in the MM IIIA period.³¹

Whoever built Troy VI brought horses with them, and some of the horses were food animals: no horse bones have been found in the first five settlements at Troy, but in the garbage dumps containing Troy VI pottery, including the earliest Troy VI pottery, Carl Blegen's team found many horse bones.³² It is very unlikely, however, that the people who built Troy VI brought horses with them only for the purpose of eating horsemeat. By the second half of the seventeenth century BC paired draft horses not only had been familiar on the steppe for more than 300 years, but also were pulling chariots in battle in Anatolia, the Levant and Egypt. Archaeological evidence for chariots at Troy VI has yet to be found, but that is not very surprising because when such evidence is found it usually comes from tombs or graves. Unlike their spectacular success on the Greek mainland, archaeologists digging at Troy and in its immediate vicinity have found very few burials from the Late Bronze Age. The few that have been found date toward the end of the Troy VI period, and they are mostly pithos burials: close to the surface, badly disturbed, and rarely accompanied by grave goods of any kind.³³ Material evidence for Troy in the Late Bronze Age comes from the settlement itself.

That the Trojans in the Late Bronze Age drove chariots depends on literary evidence, and it is strong. One of Homer's favorite epithets for Troy, or Ilios, is εὔπολος, which can be translated literally as "well-foaled," and more freely as "abounding in horses."³⁴ That the horses Homer had in mind were driven rather than raised for their meat is very clear. In twenty-one passages of the *Iliad* the Trojans are described as "horse-taming" (*hippodamoi*). These descriptions of Troy and the Trojans were not coined in Homer's own time, when a horse was rarely to be found at Troy, but were passed down from the Bronze Age.

Turning to the Greek mainland, we find that in the LH II period a good number of military chariots were apparently employed there. When Attarissiya of Ahhiya caused trouble on the coast of Anatolia he seems to have had an army based on many chariots, perhaps as many as 100.³⁵ Attarissiya lived toward the end of the fifteenth century BC, however, long after the first signs of militarism on the Greek mainland. Much earlier evidence—from the beginning of LH I—is available. At Mitrou, on the Lokrian coast of the Euboian gulf, Maran and Van de Moortel have recently found very important changes connected with the presence of tamed horses and of what they call a "warlike elite." The excavations unearthed a small artifact: a *Stangenknebel* (the first cheekpiece of that kind found in Greece) with the wave-band decoration much favored in the Carpathian basin. They also unearthed a town that was constructed early in the LH I period, and that seems to have been designed with chariots in mind. A network of broad orthogonal streets, wide enough for the passage of chariots, marks Mitrou as an urban community very different from anything in Greece that had preceded it. Maran and Van de Moortel define the transformation coincident with the arrival of tamed horses:

The antler-tine horse-bridle piece is one of several discoveries in LH I and later Prepalatial levels at Mitrou that signal a major social change—specifically, the rise of a warlike elite that assertively displayed its elevated status in life and death, transforming the settlement in the process. Only very small parts of the preceding Middle Helladic settlement at Mitrou have been excavated, but the exposed remains indicate that it had a rural character, with narrow dirt roads and open areas strewn with trash.³⁶

Although the archaeologists refrain from attributing the transformation to any event, an historian may take the liberty of doing so. I will accordingly suggest that the transformation of Mitrou was the result of a takeover of parts of eastern Greece by a military force, in which chariots played a significant role.

Kiapha Thiti, along Attika's southwestern coast, is another site that suggests the presence and importance of chariots at the end of MH III and the beginning of LH I. The hill on which the fortress was built at that time towers 100 m over the valley that it overlooks. The hill had steep sides on the north, east and south, but had a traversable slope on its western side. Excavations directed by Dietmar Hagel from 1986 to 1988 showed that low on the slope a ramp had been constructed, 70 m long. It led to the only gate through the fortification wall, the gate being 2.2 m wide.³⁷ Because the length of a chariot axle was about 1.50 m, the gate was wide enough for a team of horses and a chariot to pass through, and the ramp can be explained as an accommodation for wheeled vehicles (humans and pack animals do not need a ramp). Less informative fortification walls from this period have been found at Peristeria on the northern Messenian coast, and at Malthi, 15 km east of Peristeria (although the late MH date for the Malthi site is contested).³⁸

Skeletal evidence, bridle bits and artistic representations

For tamed horses on the mainland the most dramatic skeletal evidence, even though barely published, is that of a team of horses that had been slaughtered in the dromos of a tholos tomb at Marathon. These skeletons, unearthed by Spyridon Marinatos in 1958, date to the LH II period, toward the end of the fifteenth century BC.³⁹ Much earlier evidence is the skeleton of a horse sacrificed atop Grave 3 of Tumulus I at Vrana, a 15-minute walk from the Marathon tholos. This grave too was published only in Marinatos' preliminary reports, but its date is not disputed: late in the MH period.⁴⁰ Petros Themelis' argument that the horse collapsed on the MH grave in the Byzantine or Turkish period does not withstand scrutiny.⁴¹ Other early skeletal evidence for the tamed horse was found in 1976–77 at Dendra.⁴² A team of matched stallions was sacrificed for the funeral of the man buried under Tumulus B, and the horses were buried in a pit. The ritual was repeated for a funeral at Tumulus C. The excavator, Evangelia Protonotariou-Deilaki, concluded that both sacrifices were made late in the MH period, despite the presence of some LH sherds within the tumuli (Protonotariou-Deilaki believed the sherds were intrusive).⁴³ Any native who witnessed the slaughter of a draft team at one

of these funerals would have had no doubt about the social consequences of the tamed horse's arrival in Greece.

Bridle bits came to Greece at the same time they came to Transylvania, but not as many have been found in Greece as may have been expected. It is unfortunate, for example, that no horse harness has been published from the burial of the draft team in the Marathon tholos. Four bronze bits found in LH contexts (along with dozens of metal bits from Iron Age Greece and Cyprus) were published by Helga Donder in 1980, and a year later Crouwel published a more complete catalogue of twelve bronze bits from Mycenaean Greece.⁴⁴ Most recently, a jointed bronze snaffle was found at Thebes.⁴⁵ The bronze bits used in the Aegean were quite similar to those used in the Near East: some with straight bar mouthpieces, and some with jointed canons. Bronze bits of either type, however, seem to have been fairly late in coming to the Aegean, and must have been far outnumbered by bits made from organic material. Because none of the bronze bits seems to antedate the LH IIIB period, it appears that from the seventeenth century BC into the thirteenth most chariot horses in Greece were controlled with bone or horn cheekpieces, and with leather or cord mouthpieces. Even in the LH IIIB period, as Crouwel pointed out, the Linear B tablets imply that many of the cheekpieces dispensed from palace workshops were being made from horn.⁴⁶ In this respect, therefore, the Aegean was very different from the Near East, where (except in Hatti) bronze bits were the norm all through the Late Bronze Age. Like their contemporaries in temperate Europe and the Eurasian steppe, chariot drivers in Greece must have been satisfied with the less rigid control that organic bits provided.

The earliest cheekpieces found in Greece are organic disks (Scheibenknebel), usually with studs on their inner face. These cheekpieces were not included in Donder's and Crouwel's catalogues. For a long time after Schliemann's discovery of four of these in Shaft Grave IV nobody knew what these strange little disks were (guesses ranged from pot covers to helmet knobs). In 1964 Aleksandr Leskov, in a very short article (in Russian), made his first major contribution to archaeology: discussing two bone disks found at Trakhtemyriv, on the Dnieper about 100 km downstream from Kiev, and noting their similarity to the four bone disks from Shaft Grave IV, Leskov proposed that they were cheekpieces for a horse's bridle.⁴⁷ Other Soviet scholars found the idea persuasive as more such disks were found, although decisive confirmation did not come until Nikolai Vinogradov found two of the disks alongside each of two horse skulls in a Bronze Age burial at Krivoe Ozero. Western scholars began to accept the identification of the disks as cheekpieces when Hans-Georg Hüttel and Stuart Piggott—separately—presented the case.⁴⁸

Most of the Mycenaean Scheibenknebel have now been described and classified by Elena Kuz'mina and have also been presented—along with excellent drawings—by Silvia Penner.⁴⁹ The four Scheibenknebel from Shaft Grave IV were made from bone and—except for their elaborate decoration—are exactly parallel to cheekpieces found along the southern Urals and also at Kamenka in eastern Crimea. In addition to the four from Shaft Grave IV, two bone Scheibenknebel were found at Dendra. Especially impressive are ivory Scheibenknebel. Two of

these were found at Mycenae (one from the House of Shields, and one from a chamber tomb), and another in Tholos A at Kakovatos (LH IIIA). To these should now be added the two perforated ivory Scheibenknebel that Vassilis Aravantinos found in the *Hoplotheke* on the Theban Kadmeia.⁵⁰ Similar in shape to the organic Scheibenknebel is a terracotta cheekpiece found at Mycenae.

The fine decoration of three of the four bone cheekpieces from Shaft Grave IV make clear that from the very beginning of the LH period the men who rode in chariots were eager to display their status and their wealth. As indicated in Chapter 5, by ca. 1500 BC charioteers in the Carpathian basin were beginning to control their draft teams with Stangenknebel rather than Scheibenknebel. The find from Mitrou now shows that by the end of the LH I period at least a few Stangenknebel were being used in Greece.

Their representations in LH art, now assembled by Feldman and Sauvage, show the high value of horses and chariots in Mycenaean Greece. The earliest representational evidence of course comes from the stelai that stood on Grave Circles A and B at Mycenae: reliefs on five of the thirteen sculpted stelai (one of the two from Circle B, and four of the eleven from Circle A) display chariots.⁵¹ John Younger concluded that at least two of the stelai depicted horses and chariots in military settings.⁵² The great majority of chariot representations in Mycenaean art are on vessels dating to the LH IIIA and IIIB periods, the fourteenth and thirteenth centuries BC, and in these representations the chariot is never depicted either in action or prepared for action on the battlefield. The “dual chariots” painted on scores of kraters are regularly in a ceremonial setting, aptly described by Sauvage:

The representations on chariot kraters are processional: the horses are walking at a slow pace and are generally seen in overlapping profile. . . . The crew of the chariot, as a rule, consists of two persons, the first a driver, the second an official or high-ranking person sometimes shaded by a parasol attached to the box.⁵³

It is likely that the kraters were painted—often in a very perfunctory way—for a specialized clientele, and had a specialized function. Of the 277 chariot vases catalogued by Sauvage, a third come from tombs at Enkomi and other sites on Cyprus, and another sixty were found at Ugarit, some of them in the homes of men associated with the *maryannu*.⁵⁴ Possibly the chariot krater was intended to provide the chariot crewman, alive or dead, with an apotropaic charm: a scene in which the chariot crew was clearly out of harm’s way. A parallel may be the thousands of “cavalier” figurines, which Roger Moorey persuasively argued were votive objects meant to keep riders safe.⁵⁵

War and peace in Mycenaean Greece

Linear B tablets indicate that the palaces maintained large chariotries. The palace at Pylos must have counted on well over 200 chariots, and Driessen has calculated

a minimum of 310 chariot boxes and 335 wheel-pairs inventoried by the Knossos scribes.⁵⁶ Given the peaceful scenes painted on the chariot kraters, however, many archaeologists doubt the military purpose of these chariots. Discussion of warfare in the late MH and most of the LH periods is necessarily and frustratingly speculative, but we may begin with the generalization that although military chariots in the Near East must initially have been used against the long line of an ÉRIN.MEŠ plodding along on foot, by the middle of the seventeenth century BC chariot warfare was well under way. This kind of warfare was to last for over 400 years and in it one kingdom's chariots were deployed against another kingdom's chariots. A military force arriving in Greece shortly before 1600 BC would have encountered neither an ÉRIN.MEŠ nor a hostile chariotry. The arriving force, I suppose, would have had little or no opposition from native mainlanders as it established control over eastern Attika, the Argolid, the western coast of the Peloponnesos, and other desirable places. If, as seems likely, parts of the mainland had been required to pay tribute to Knossos the native population may even have given a tepid welcome to the military intruders. The "shock and awe" that must have been a prime factor in the takeover of the Carpathian basin may also have made a takeover of parts of the Greek mainland a relatively bloodless affair.

It must be assumed that military newcomers would have had to confront the Cretans who until then had—perhaps with the assistance of a very few chariots—controlled and exploited eastern Attika and several other mainland coasts. Even this conflict, however, may have been brief and on a relatively small scale: in order to profit from the Laurion mines the newly arrived military men must have found a *modus vivendi* with at least some Cretans, who alone had sufficient experience not only with managing the mines but also with the manufacture of bronze and silver artifacts and with the trading of these and other goods in Levantine and Egyptian ports. The town at Ayia Irini on the offshore island of Keos seems to have continued its close relationship with Crete through much of the LM I period. It could hardly have remained subject to a Cretan ruler in the LM II period, however, since by that time Crete itself had fallen under the control of Greek overlords. The frescoes recovered from Ayia Irini, fragments of which were found in the (earthquake) destruction level from the end of the LM II period, are very much in the Minoan tradition, but items of dress are more Mycenaean than Minoan.⁵⁷ The frescoes depict a ceremonial procession of some kind, in which at least two teams of chariot horses are included.⁵⁸ If a force from the mainland had taken control of Keos by the beginning of the LM II period, as is very likely, it must have done so with limited damage to the town at Ayia Irini and with limited disruption of the town's material culture.

The conquest of Crete, at the end of LM I (when the palaces except for Knossos were destroyed), must have entailed considerable bloodshed. By ca. 1450 BC the rulers of Crete must have assembled a modest chariotry with which to defend their kingdom, and the first true chariot battles in the Aegean world may have been fought on the Messara and the smaller plains of Crete. After the conquest of Crete was completed the mainlanders' chariots would have had little more to do on the island, but opportunities for battle were evidently sought on the coast of Anatolia.

More chariot warfare may have occurred when regional military forces in Greece became rivals. Violence of some sort may have accompanied the *synoikismos* of Attika, which seems to have occurred at the end of LH II (ca. 1400 BC) and to have shifted power from eastern Attika (Thorikos and Marathon especially) to Athens.⁵⁹ Similar centralizations may have happened in Messenia and Boiotia. Finally, if—as it seems—the rulers of Mycenae did indeed become Great Kings, their consolidation of power at Mycenae must have required the subordination of a constellation of petty kings.

In the IIIA and IIIB periods Mycenaean chariot armies must have served primarily as a deterrent or as an offensive threat against any pharaoh or Great King in the Near East who was hostile to the Great King of Achaea. Relevant here is the vaunt that shortly before 1350 BC Amenhotep III had inscribed on a statue base in his mortuary temple at Kom el-Hetan, across from Karnak.⁶⁰ Inscriptions on four other bases from Kom el-Hetan refer to Syria and Mesopotamia, each listing cities in those lands that Amenhotep boasted were subject to him. The fifth base referred not to Syrians or Mesopotamians but to *k-f-tj-w* (Crete and Cretans) and *tj-n3-jj-w*, the Egyptian name for the Greek mainland.⁶¹ In apposition to the names *k-f-tj-w* and *tj-n3-jj-w* were eight place-names that Egyptologists have with some confidence identified as Amnisos, Knossos, Kydonia, Kythera, Lyktos, Messena (or Methana), Nauplia and Mycenae. We have, of course, no reason to think that Amenhotep III ever reduced any of these places to vassalage, but he clearly wished his subjects and his gods to believe that he had done so.

Also relevant is the chronic hostility between the Achaeans and Hittite kings. This was centered on the coast of western Anatolia, and especially at the cities of Miletos and Troy. These two small kingdoms seem several times to have changed their allegiance between Hatti and Achaea, and “Hittite texts show that from the late 15th until the third quarter of the 13th century BC, the kings of Ahhiyawa were in a position to threaten Hittite interests in Western Anatolia.”⁶² Various Hittite kings also had ambitions to subdue cities across the sea. The Hittite kings were especially keen to have vassals in Cyprus, rich in copper, an island in which the kings of Achaea also had an interest. According to the Madduwatta text, a Hittite king late in the fifteenth century BC—probably Arnuwanda I—claimed that Cyprus (Alashiya) belonged to him. As Hans Güterbock observed, however, “We do not know on what grounds Arnuwandas could claim Cyprus for himself.”⁶³ In any case, the island obviously did not remain under Hittite control. According to a clay tablet found at Hattusha, shortly before 1200 BC Suppiluliuma II, the last Great King of Hatti, defeated ships of Alashiya and then conquered the island, removing the king of Alashiya, his wives and his children. In Güterbock’s translation of the tablet, Suppiluliuma claims that “the country of Alašiya, however, I [enslaved] and made tributary on the spot,” imposing on the man he installed as king of Alashiya an annual tribute of gold, copper and other valuables.⁶⁴ It is most unlikely that Suppiluliuma did in fact conquer or re-conquer Cyprus, although it may well be that one or two cities on the island became tributary to him. In any case, it is clear that the Great Kings of both Achaea and Hatti had continuing designs on cities abroad.

Threats or possibilities of that kind were very likely what required the Great Kings of Ahhiya/Achaea to maintain sizeable chariotries during the LH IIIA and IIIB periods. It has often been deduced that the Mycenaeans' chariots could not have been intended for use in battle because most of the Greek terrain was unsuitable for chariot warfare. That deduction rests, however, on the false premise that Bronze Age warfare was essentially the work of infantrymen, who could fight in all types of terrain. It is certainly true that in much of the Greek (and Cretan) landscape chariots would have been useless, but a Mycenaean king had no need to worry about such parts of the landscape. Although "barbarians" in the hills may have occasionally required retaliation by the king's warriors on foot, such barbarians were a nuisance rather than a lethal threat. Kingdoms worried about other kingdoms, and a king had chariots in order to defend his realm against another king's chariots. Offensive infantrymen being still in the future, a Mycenaean king assumed with good reason that if and when he would be required to fight a real battle, it would necessarily be in a place where chariots could be deployed. Like other deterrents in other times, the LH IIIA and IIIB chariots may seldom have been used. When at the end of the Late Bronze Age great and unprecedented danger did finally come to the Aegean, the Mycenaean chariotries were no more effective against hordes of raiding "runners" than were the much larger chariotries of the Egyptian and Hittite kings.

No taxed infantrymen in Mycenaean Greece

We have plenty of evidence for heavily armored chariot crews in the Late Bronze Age, but none—whether in the Near East or in Greece—for heavily armored warriors who fought on the ground. In the Late Bronze Age there was not yet anything like the Greek phalanx or the Roman legion of Classical times, nor even like the Homeric *stichos*: a line of offensive infantrymen carrying shields and wielding spears. Accordingly, we have no evidence—whether in the Near East or in Greece—for chariots in the Late Bronze Age transporting heavily armored infantrymen to a battle. In contrast, we have plenty of evidence that in the Late Bronze Age chariots served as mobile platforms for archers who shot their arrows against the opposing chariots. Nevertheless, on Homer's authority many specialists on the LH Aegean have believed that the Mycenaean palaces kept several hundred chariots to serve as battle-taxis for several hundred heavily armored infantrymen who are supposed to have fought against the enemy's heavily armored infantrymen.

That thesis was urged especially by Mary Littauer and Joost Crouwel. In their objections to my reconstruction of Late Bronze Age warfare Littauer and Crouwel argued that even in the Near East the chariot was of limited use, and that in Greece the chariot appeared in the preliminaries to a battle but not in the battle itself. Necessarily, Littauer and Crouwel went on to deny the importance of the bow in Mycenaean warfare:

In Greece, there is no evidence for the association between the military chariot and the bow so well documented in the Near East and Egypt. Instead, chariots

here functioned as a means of transport for warriors who fought not from the vehicle but on the ground with close-range weapons—a role determined to a large extent by the nature of the terrain.⁶⁵

Why the nature of the terrain kept an archer from shooting arrows from the chariot, but allowed the chariot to carry an infantryman wherever he was needed has never, so far as I know, been explained. Jan Driessen made the good observation that the 250 chariots of Knossos could not have defended outlying parts of the kingdom because no suitable road system had been built in the LM period. He attempted, however, to salvage the battle-taxi thesis with the proposal that the chariots of Knossos and Pylos—meant only to defend the land close by the unwallled palaces—would have done so by transporting heavily armored warriors to the front where attackers were advancing toward the palace. The chariots, that is, would have delivered a “wall of bronze” to make up for the lack of a Cyclopean wall around the palace.⁶⁶

Wherever one imagines the taxis depositing their warriors, it is difficult to imagine in what sort of battles, and against what sort of enemy, so tiny and so lumbering an infantry would have been effective, each man arriving at the scene in his own taxi. Nor can one imagine what would have happened had King Attarissiya brought to Anatolia 100 such chariots, and 100 such infantrymen, and had then been confronted by the chariotry sent from Hattusha, each Hittite chariot carrying an archer armed with a composite bow. I suspect that most of Attarissiya’s horses would have been hit long before his chariots reached a place at which the infantrymen were to be unloaded.

Service as taxis for warriors who fought hand-to-hand is of course the role assigned to chariots in the *Iliad*. How such a role may have materialized in the epic tradition was suggested by P. A. L. Greenhalgh. When troops were mustering early in the Archaic period, Greenhalgh pointed out, many of the *basileis* came to the mustering ground on horseback, and he suggested that in the Geometric period—when riding was still uncommon—chariots may have provided the *basileis* with the impressive transport they desired.⁶⁷ In the Late Bronze Age, however, the age of chariot warfare, chariots as taxis for infantrymen make no sense. It does not help to cite Julius Caesar’s account (*De bello Gallico* 4. 32–33) of his invasion of Britain, more than 1000 years later in the evolution of military weapons and tactics. Caesar reported that some of the British warriors rode in chariots toward his legionaries, then leaped off and fought on the ground. The British warriors may have given Caesar’s swordsmen some grief, but neither the Britons nor their horses would have fared well against arrows shot from composite bows 100 m away.

Here we must examine the belief that the corselets shown in ideograms on the Linear B tablets, and exemplified by the famous Dendra corselet, were not worn by the chariot crew but were designed for men who fought hand-to-hand on the ground. Homer, first of all, imagined his heroes as quite agile or even fleet of foot (as, incidentally, were the British riders who leaped off their chariots and rushed upon Caesar’s legionaries), and not as wearing something so cumbersome as the

Dendra corselet: that panoply weighed at least 15 kg, and its plates extended to mid-thigh and would have prevented the wearer from moving at a rate more rapid than a hobble. Crouwel conceded that an infantryman wearing something like the Dendra corselet would have been more or less stationary:

The Dendra fighter would not have needed a shield and would have had both hands free to handle his weapons. At the same time, his mobility on the ground would have been minimal and he would surely have needed a vehicle to convey him any distance once he was armed.⁶⁸

It is difficult to imagine how a chariot could have delivered such a ponderous infantryman into the midst of a fray, or—even worse—picked him up when he was wounded or exhausted. The chariot driver and his horses would have been easy targets, leaving the heavily armored infantryman with no taxi to carry him back to safety.

The taxied infantryman was an important device for Homer's poetry—allowing the poet to focus on the heroes *seriatim*, as one by one they were brought into the poetic narrative—but in the real world neither a chariot driver nor a taxied infantryman wearing the Dendra corselet would have survived very long. With good reason Hans-Günter Buchholz, in his final fascicle on warfare in the Mycenaean period and in the Homeric epics, concluded that Homer's depiction of chariots as taxis for infantrymen shows decisively that the poet did not know how chariots were used—or how battles were fought—in the Late Bronze Age.⁶⁹

Bows and arrows

The bow is the least publicized of the weapons prized in the new militarism on the Greek mainland. In Mycenaean art the bow seldom appears. It is true that scenes of violence in Mycenaean art usually included both opponents, and that inclusion of both an archer and the person or animal he was targeting demanded a considerable space (a wall of an Egyptian pharaoh's mortuary temple served very well). The absence of the bow in Mycenaean art is nevertheless striking. Helen Lorimer, discounting the Silver Siege Rhyton as Minoan, found only two representations, both from Shaft Grave IV.

Surviving arrowheads indicate that impressive bows were placed alongside many of the men buried in the Shaft Graves, but no Mycenaean bow has survived to be uncovered by archaeologists. Self bows are entirely perishable, but a composite bow can leave durable traces. Although the wood core and the sinew on the outer face of a composite bow must have perished long ago, as must have the bow string (often made from the sciatic nerve of an ox or some other large animal), the inner facing of horn can survive. At Sintashta, as we have seen, pieces of horn have been identified by Russian archaeologists as the remains of composite bows. No such pieces have yet been noticed in LH tombs.

Although Mycenaean chariot kraters do not show archers riding on chariots, neither do the kraters or other LH media (with the probable exception of the Shaft

Grave stelae) show chariots in military action of any kind. For that, we must therefore look elsewhere. In the Near East, as is well known from textual and pictorial evidence, the chariot warrior was an archer. The same can be said for India, as the hymns from the Rig Veda show so clearly. For the Eurasian steppe of course we have no such literary evidence, but the discovery of bow fragments and of arrowheads show that here too archers armed with composite bows rode in the chariots. In southern Caucasia, as we have seen in Chapter 3, the chariot buried at Verin Naver carried a quiver stocked with sixty arrows. It is hardly a surprise, finally, that Chinese chariots also carried archers:

As in Indian and West Asian chariot battles, the prime weapon of attack and defence was the arrow fired from a composite bow. Its power, we are told, was enough 'to pierce seven layers of armour'. Everything possible was done by the arrowsmith to ensure ease of firing and trueness of flight.⁷⁰

Grisly evidence for the chariot archer in China comes from the "chariot pits" that were adjacent to the large tombs of Shang rulers. Several of the pits contained, in addition to the chariot, the skeletons not only of the horses but also of the three crewmen who were ritually slain to accompany their ruler into the Underworld. In M20, the most informative of the pits, the skeleton in the middle was the driver and the skeleton to his right was probably a shield bearer, although nothing of the shield remains. The figure to the left, as detailed by Edward Shaughnessy, "was armed with a bow and arrows, a bronze knife and a whetstone. This corresponds exactly to descriptions in texts from later periods of the composition of a chariot team."⁷¹

Like their counterparts everywhere else in Eurasia, the Mycenaeans should be assumed to have used their chariots as mobile firing platforms for archers.⁷² Such an assumption, however, meets much resistance. Until the 1950s, despite the number of arrowheads that had already been discovered in LH contexts, archaeologists were quite certain—such was the authority of the *Iliad*—that although the bow may have been important to Minoans the Mycenaeans made little or no use of it in combat.⁷³ The stone arrowheads from the Shaft Graves were assumed to have been intended for hunting, the bronze arrowheads from Knossos were assumed to have been used by Minoans, and the hundreds of arrowheads from Pylos were supposed to have been made and used by Minoans who had moved to the Greek mainland after Knossos was destroyed.

Although these assumptions were upended by Ventris' demonstration that the Linear B tablets were written in an early form of Greek, the bow still has not received the attention it deserves. My attempts to place archers on Mycenaean chariots were quickly met by the considerable authority of Jan Driessen:

Although Drews pays little attention to the Homeric warrior, it seems obvious that the latter was a man of status, especially capable of man-to-man fighting, and thus not merely an archer, a man of lesser reputation and of secondary status as was for instance the case in Egypt. One of the arguments used by

Drews to associate chariotry and archery in Mycenaean times is the fact that quite a few Linear B tablets at Knossos were found together with tablets inventorying more than 8000 arrows as well as with many real bronze arrow heads in a building therefore called the Arsenal. Leaving aside the extremely rare iconographical association of chariots and archers, I will try to show in this paper, firstly, that the chariot tablets found in the Arsenal deal primarily with inventories of storage and less with distribution and that those records dealing with the allotment of chariots give no clue about this presumed archery association. Moreover, since it is assumed that those using the chariots, the warriors, were clad in bronze armour, it is unlikely that they could actually manipulate bows.⁷⁴

Driessen then goes on to accept Littauer and Crouwel's thesis that the Knossos chariots were used to transport armored infantrymen. Proceeding as it does from the equation of "the Homeric warrior" with the warriors of LH Greece, the argument not surprisingly relegates the archer to a secondary status. It is surprising, however, that Egyptian archers are cited as examples. I suspect that every Egyptian pharaoh from Ahmose to Ramesses III, proud to be depicted in temple reliefs as shooting an arrow from a swiftly moving chariot, would have been apoplectic at being described as "merely an archer." The argument also seems to imply that the thousands of arrows stored in the Knossos Arsenal were intended for archers on foot, although no evidence for companies of infantry archers has yet been found in LH Greece. The argument closes with the implication that although the bronze armor prevented a warrior in a chariot from drawing a bow it would not have prevented a warrior on the ground from wielding a sword or thrusting a spear.

Let us look yet again at the evidence for bows and arrows in Mycenaean Greece. Arrowheads, in contrast to bows, have been found in large numbers in LH contexts. They are too small and homely to attract the average museum visitor or weapons aficionado, but we are fortunate that the bronze arrowheads from the Greek mainland (although not from Crete) were catalogued and published by Robert Avila for the *Prähistorische Bronzefunde* series.⁷⁵ In the LH III period arrowheads were made of bronze, and were made by the thousands in workshops overseen by the palaces. Evans found several hundred *in corpore* arrowheads in his excavation of "the Palace of Minos." At Pylos, in one room of the palace Carl Blegen came upon a store of 500 bronze arrowheads, all of them barbed and therefore meant for battle.

Some recognition of the importance of archery early in the Mycenaean period came in 1962 with a lengthy article by Hans-Günter Buchholz. Buchholz showed that the grooved stone that Schliemann had found in Shaft Grave VI was designed to smooth the shafts of arrows, and Buchholz then went on to offer a basic classification of the arrowheads known from Greek prehistory, from the Neolithic to the end of the Bronze Age.⁷⁶ Unfortunately, in the first two fascicles (1977 and 1980) on Mycenaean warfare that he wrote for the *Archaeologia Homerica* series Buchholz did not deal either with long-range weapons or with chariots. That huge gap was not repaired until 2010, when the third *Kriegswesen* fascicle appeared.

Here Buchholz presented in detail the archaeological and documentary evidence both for chariots and for bows and arrows in LH Greece.⁷⁷

The Linear B tablets have shown how involved the palaces were in the production of bows and arrows. A tablet from Knossos refers to enormous arsenals of arrowheads: 2630 in one batch and 6010 in another.⁷⁸ If every chariot archer carried sixty arrows in his quiver, the latter store would have equipped 100 chariots. Another tablet, this one from Pylos, records a requisition of approximately 51 kg of bronze and specifies that various officials and supervisors “will contribute bronze *for ships* and the points of arrows and spears.”⁷⁹ In his recent survey of the tablets’ contents Thomas Palaima called attention to “the Mycenaean military industrial complex” and calculated that the bronze in question was “sufficient for 33,000 arrowheads or 143 spearheads.”⁸⁰

More specialized than the making of arrows was the making of bows. These too were a high priority for the palaces, as Buchholz observed:

The manufacture of bows is of no concern to Homer. The Mycenaean palace authorities, however, reserved this industry, as we see from its inclusion in the Pylos archive, under state control. *To-ko-so-wo*, according to the decipherers, corresponds to *toxō-worgoi*, τοξοποιοί [bow-makers]. The root word, τόξον, evidently a loan-word from Old Iranian, was already adopted into the Greek language in Mycenaean times, and thereafter passed into early Greek epic.⁸¹

At the beginning of the Mycenaean period, of course, there were not yet palaces to see to the manufacture of bows and arrows, and the shaft-smoother in Shaft Grave VI was necessary for the archer who was responsible for supplying his own weapons.

As Buchholz indicated, the Classical Greek word for “bow”—τόξον—is attested in Linear B tablets, although an older word for “bow”—βιός—was still used occasionally in the *Iliad* and *Odyssey*. The newer word, τόξον, seems to have a connection with Proto-Iranian. It has recently been argued by Pierre Sauzeau that although Greek warriors in the Iron Age disdained the bow, the proto-Greeks seem to have shared with Indo-Iranians a high regard for the bow that is not evident in Celtic, Italic and Germanic societies.⁸² Sauzeau cites the archer gods Apollo and Artemis, and heroes such as Herakles and Odysseus, but he depends also on linguistic evidence.

Whether Mycenaean warriors were equipped with composite bows or some variation of self bows is debated. Helen Lorimer’s *Homer and the Monuments* insisted that although the Minoans used the composite bow the Mycenaeans did not. The weakness of that argument was shown by Wallace McLeod in his 1966 dissertation, but Lorimer’s views remain influential.⁸³ McLeod concluded that the Mycenaean bow may have been either a composite bow or an “angular” bow: made, that is, from a single stave of wood, but having a stiffened grip, or center, that remains straight when the limbs are drawn forward. One argument that the Mycenaeans used the composite bow relates to the possible use of horn in their

manufacture. Ideograms on Linear B tablets of the Mc class at Knossos show that the palace acquired goat horns, and because these tablets came from the palace's "Armoury" one obvious purpose for the horns would be to face a composite bow.⁸⁴ Other arguments that the Mycenaeans knew the composite bow are literary. In the eighth century BC Homer and his audience had a vague notion of how a composite bow was made. Describing the origin of Pandaros' well-polished bow, Homer told (*Iliad* 4. 105–111) how Pandaros killed a wild goat and took the horns, which were sixteen palms long, to a craftsman skilled in working with horn. The story of the stringing of the bow, in *Odyssey* 21, seems to have originated in a society familiar with composite bows: the stringing of a composite bow is far more difficult than the stringing of a self bow.⁸⁵

Mycenaean archers were probably not above dipping their arrows into poison. Obviously we have no archaeological or documentary evidence for the practice, but the literary and linguistic evidence is considerable. Homer and his audience knew about poisoned arrows. At *Odyssey* 1.260–262, the poet has Taphian Mentès (Athena in disguise) recalling that as a lad he first met Odysseus when the hero had journeyed to Ephyre in order to get from King Ilos some "man-killing poison" with which to smear his arrowheads. Fearing the gods, Ilos refused to give Odysseus the poison, so Odysseus next betook himself to the palace of Anchialos, Mentès' father and king of the Taphians, and Anchialos gave Odysseus the poison that he sought. Myths told of Herakles killing the Stymphalian Birds with poisoned arrows, and of Apollo spreading plague with poisoned darts. On the linguistic side, the Greek words for bow and arrow were associated with poison. The Greek noun *iōs* (cognate with Sanskrit *iṣu-* and Avestan *iṣu-i*) meant both "arrow" and "poison."⁸⁶ The Greek *τόξον* also had connotations of poison. The adjective *τοξικόν* went directly into Latin as the noun *toxicum* ("a poison into which arrows were dipped"), whence the French *toxique* and the English "toxic." Poisoned arrows would have been meant for combat, and not for hunting.

That the bow was carried in Greece by the first military men, at the end of the Middle Helladic and the beginning of the Mycenaean period, is very clear. In Shaft Grave VI at Mycenae was the stone tool that Buchholz identified as a scraper or smoother of arrow shafts. The graves also yielded an array of arrowheads, all made from flint, obsidian or other stones. Shaft Grave IV yielded thirty-eight arrowheads (twenty-six of flint, and twelve of obsidian),⁸⁷ enough to have filled a quiver for an archer to take to the Underworld. Still earlier are the arrowheads from Grave Circle B. Mylonas found seventeen flint arrowheads in grave Delta, and in Lambda twenty-four of flint and twenty of obsidian.⁸⁸ As mentioned above, the two representations of archers that Lorimer identified as Mycenaean came from Shaft Grave IV. Bows and arrows had been known in Greece since the Paleolithic period, but toward the end of the MH period their importance made a quantum leap. The men buried in the warrior graves at Kolonna (end of MH II) and Thebes (end of MH III), like many of the men buried in the Grave Circles at Mycenae, went to the Underworld with arrows and therefore surely with a bow no less impressive than their other weapons.

Swords

The new militarism was displayed most conspicuously in swords. A schematic graph drawn by Barry Molloy shows dramatically the quantity of swords recovered from the Late Bronze Age Aegean.⁸⁹ Although the early sword was meant for display, it could also serve as a defensive weapon for one or both of the chariot crewmen: like the spear, it would have been useful against an opponent on the ground who had come too close to be targeted with the bow. In the warrior grave excavated at Thebes in 1982, a grave dating to the end of the MM III period, Greek archaeologists found a single Type A rapier. It had a length of 86 cm, and its organic hilt was attached to the blade by two rivets through the tang and two more through the shoulders.⁹⁰ Slightly later was the Type A rapier found in a tholos at Kakovatos, on the coast of Elis.⁹¹ This too was an elegant weapon, with a length of 92 cm, its hilt fastened to the blade with a single rivet in the very short tang and two rivets through the shoulders. More impressive is a burial not far from Pylos that Schofield describes:

At Routsí-Myrsinochorion an unrobbed tholos tomb was discovered with the final burial in the tomb preserved intact. On the floor of the tomb lay a warrior burial of a man, who had been placed on a red-and-blue rush mat or blanket. He wore a necklace of amber beads and was accompanied by ten swords and daggers.⁹²

Most recently discovered is a Type A rapier in the stunningly rich grave (probably from the LH II period) of the “Griffin Warrior” at Pylos.⁹³ That sword, again almost 1 m long, had a hilt of ivory covered with gold leaf, and lay atop a dagger with an equally ostentatious hilt.

Impressive as they are, the finds along the west coast of the Peloponnesos pale in comparison to the pile of swords found in the Shaft Graves at Mycenae.⁹⁴ In Circle B Papadimitriou and Mylonas found at least fifteen swords, one of which was a well-hilted Type B and one a slashing cleaver. All of the others were Type A rapiers. In the early phase of burials in Circle B a sword was usually placed alongside the man’s body. The ceremonious deposition of so costly and fearsome a grave good must have deeply impressed the onlookers, as Katherine Harrell has imagined:

The earliest interments at Mycenae in Grave Circle B (Graves Zeta, Eta) each contain either a sword or a dagger, without other martial accoutrements. These are the oldest sword blades to be found at the site, and it is worth emphasizing their novelty and beauty: the sword from Zeta is nearly 1 m in length and hilted in gold and ivory. Their interment must have been quite a spectacle.⁹⁵

As generations passed, more and more goods were deposited with each burial, and a single sword was no longer a sufficient dedication at the funeral of a great man. Grave VI, one of the later graves in Circle A, contained nine swords and each of the still later Graves V and IV contained several dozen. Three men and two

women were at different times buried in Grave IV, and there is no telling how many swords were deposited with the burial of each chief, but Harrell is certainly justified in speaking of “the fetishization of the sword that developed through the Shaft Grave period.”⁹⁶ Harrell suggested that by the end of the LH I period the funeral of a leader may have been an occasion for his important followers to “give back” to the deceased the ornate swords that the deceased had once bestowed upon them.

The Type A rapier was evidently the most admired sword that could be given or received. Noting that the Type A have intricate decorations and their successors do not, Colin Macdonald suggested that the Type A were mostly imported from the superb workshop at the Knossos palace, while later swords were made in the Argolid by craftsmen who had limited experience in engraving or chasing bronze.⁹⁷ Although the Type A had a long history, going back to the MM II period in the Aegean and to the end of the third millennium BC in south Caucasia, soon after 1600 BC the military men in Greece devised a more reliable sword. The evolution of the sword from Type A to Type B in Greece was just as rapid as its parallel evolution in the Carpathian basin, where the Type A gave rise both to the Boiu Griffzung and to the Apa Vollgriff, probably over the course of two generations. The remarkable evolution of Aegean swords over the Late Bronze Age has been shown in detail by Molloy (see Figure 6.1).⁹⁸

The first Type B rapiers were made early in the LH I period, and many were deposited in the Shaft Graves. These rapiers, all of them shorter and some much shorter than the Type A, had a tang extending through most of the haft and in some specimens all the way to the pommel. By the beginning of LH II, ca. 1450 BC, swordsmiths in mainland Greece had made still more improvements and were producing what Sandars classified as Type C swords. The Type C had “horned” shoulders and a flanged tang, and was therefore a *Griffzungenschwert*. In the LM II period (ca. 1450–1400 BC) many of the Type C were buried with the warriors in the warrior graves near the Knossos palace. Like their Type B predecessors the Type C were certainly designed for combat.

Spears

The Shaft Graves show that along with swords, late in the MH period, came spears. As noted in Chapter Three, prior to the Shaft Grave era the Greek mainland has yielded only two metal spearheads: one from EH Lerna, and the other from MH Sesklo.⁹⁹ The Lerna head was tanged, and the Sesklo head was “shoed.” In contrast, Robert Avila catalogued almost 200 spearheads certainly from the Mycenaean period. Almost all of these were socketed, a significant improvement over the “shoed” (in Avila’s classification the shoed heads are Type I and the socketed Type II). Some of the Type II spearheads were merely large. Avila’s no. 11, from grave Alpha in Grave Circle B, was 37 cm long, and no. 16, from Shaft Grave VI in Circle A, was 32 cm long. Other Type II spears, all from the Grave Circles, were spectacular, resembling a pike or a sarissa.¹⁰⁰ With bronze heads of 51 cm (no. 8), 53 cm (no. 9) and even 58 cm (no. 12), these spears were

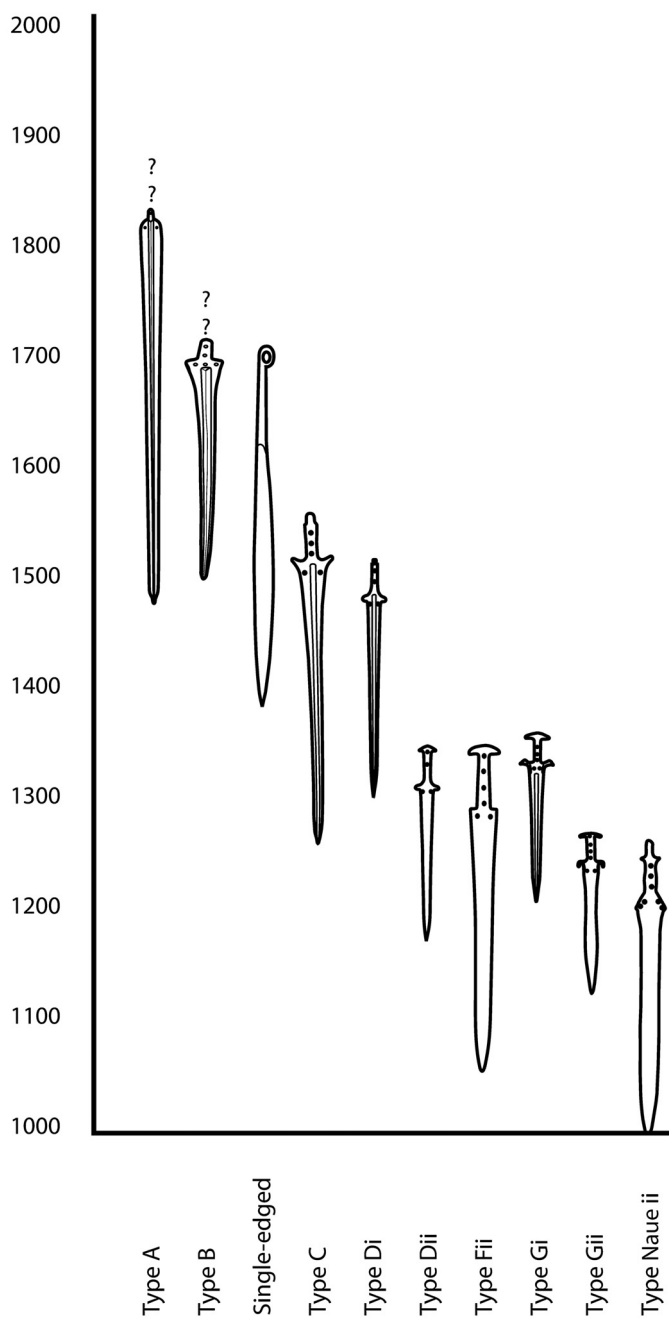


Figure 6.1 Evolution of the sword, and chronological range of sword types, in Mycenaean Greece. From Molloy 2010, Figure 2. Courtesy *American Journal of Archaeology* and Archaeological Institute of America

as formidable as any known from the ancient world. The Type II were evidently in use from the end of the MH through the LH I period. Most of them were found in Grave Circle A, but nos. 8, 10 and 11 came from Grave Circle B (Graves Alpha, Iota and Nu). The Type II were followed by Avila's Type III spearheads, including the four poorly preserved specimens (nos. 37–40) found in the Dendra tholos tomb. These Type III, known mostly from the LH/LM IIIA period, had a leaf-shaped blade, and were almost as large as the Type II. The badly damaged no. 39 was 57 cm long, and no. 43, found in a richly equipped warrior grave at Knossos, was 56 cm long. With their elegant decoration these must have been very impressive weapons.

For what were such great spears intended? A favorite theme in Mycenaean art was of spearmen thrusting their weapons against a lion. The most famous of these depictions were inlaid on the "lion hunt daggers" found in Grave Circle A. Since Nancy Thomas has shown that the lion was indeed still present in Greece in the second millennium BC, it may be that great spears were wielded with both hands by hunters confronting a lion.¹⁰¹ By the beginning of the LH IIIB period great spears had given way to considerably smaller thrusting spears.¹⁰² And because killing a lion had for 300 years been the ultimate display of heroism it may be that by the beginning of the LH IIIB period the lion population in Greece had been much depleted.

Although the killing of a lion was perhaps especially praised by the local population on the Greek mainland, spears as large as those found in the Shaft Graves must also have been intended for combat. A lance was often carried on a chariot, to be used against an enemy on foot who was menacing the crew or the horses and was too close to be targeted with a bow. Another military use of the great spear is indicated by the frescoes, carefully reconstructed from the fragments in which they were found, in room 5 of the West House at Akrotiri. The frieze on the south wall shows a fleet of seven ships, each carrying a contingent of helmeted warriors, sailing from a small city on the left to a larger city on the right. In this Flotilla Frieze fresco the larger ships are propelled by at least forty-two oarsmen, who are assisted by rectangular sails.¹⁰³ The frieze on the north wall, the "Sea Battle Fresco," shows three naked men falling into the water or drowning while eight warriors walk on the shore, evidently after a battle has ended in their favor. The eight point their spears upward at a 45-degree angle, and the spears appear to be some 4 m long. The men are armored with boar's-tusk helmets and large leather (oxhide) shields and are girded with swords, but the spear is their primary weapon.

Several interpreters, beginning with Spyridon Marinatos who excavated the West House at Akrotiri, have proposed that the spearmen wielded long thrusting spears from their ships, against either the crewmen and marines of enemy ships or against enemies who attacked the ships as they came ashore. *Iliad* 15. 385–389 describes the Achaeans using ναῦμαχα to defend their beached ships against the Trojans who were trying to board them. These *naumacha* were, as defined by Autenrieth, "ship-pikes." In the *Iliad* passage the Trojans and Achaeans fight a battle at the ships, the Trojans with their customary spears, but the Achaeans, in the translation

of Lang, Leaf and Myers, “climbing up aloft, from the black ships, with long pikes that they had lying in the ships for battle at sea, jointed pikes shod at the head with bronze.”

The question remains whether the frescoes in the West House at Akrotiri are Minoan or Mycenaean: whether on the eve of the volcanic eruption, that is, Thera was subject to the palace at Knossos or to some regime on the mainland. Sarah Morris made a detailed argument that although the frescoes in room 5 of the West House seem to have been done by a Minoan artist they reflect the mindset of a Mycenaean and they tell a Mycenaean story, perhaps of a Mycenaean expedition to coastal Anatolia.¹⁰⁴ There is no doubt that Thera had been under Cretan control in the MM III period, and it is very likely that by the beginning of the LM/LH IIIA period, when Achaeans under Attarissiya were causing trouble on the coast of southwest Anatolia, all of the Cyclades along with Crete itself were subject to a ruler on the Greek mainland. It cannot be excluded that Thera was taken over by a force from the mainland already during the LM/LH IA period. Since that possibility is available, we may double down on the “Mycenaeans at Thera” theory, and wonder whether the frescoes in room 5 of the West House at Akrotiri tell the story of a fleet from the mainland that had recently sailed to Thera, bringing troops who defeated a small Cretan force that until then had controlled the island. Chariots were probably not involved in a Mycenaean takeover of Thera, whenever that happened, although chariot sealings have been found at Akrotiri.¹⁰⁵

Armor

In the Mycenaean period boar’s-tusk helmets were apparently worn both by charioteers and by warriors on foot. Such a helmet not only provided protection for the head, but also marked its wearer as a warrior of high status: the three registers of tusk plates, each sewn onto a leather cap, required the killing of several dozen wild boars. Nothing else quite so clearly expresses the period’s militaristic pride and display as these helmets.¹⁰⁶ The boar’s-tusk helmet probably made its appearance on the Greek mainland toward the end of the MH II period and was seen frequently by the LH I period. Remains of boar’s-tusk plates were found in Grave Circle B, and in the “Sea Battle Fresco” from Thera each of the men carrying a tower shield wears a plumed helmet made from boars’ tusks. From the end of the MH III period we now have the boar’s-tusk helmet from the warrior grave at Thebes. Still earlier, however, are boar’s-tusk plates found in a house at Eutresis and in the “Shaft Grave” at Kolonna, both dating to the MM II period.

It is possible that Cretan commanders at Aigina and other outposts had worn such helmets, and that the military newcomers on the mainland admired the look of the helmets and began killing boars wherever they could find them. Although the tradition of warriors’ wearing boar’s-tusk helmets evidently began and ended in the Bronze Age Aegean, it must be said that boars’ tusks had been used for tools, for personal adornment, and possibly for protection already in the Paleolithic period. As mentioned in Chapter 3, a Neolithic cemetery at Mariupol, on the Sea of Azov, yielded 429 boar’s-tusk plates, distributed over a dozen graves. Most of

those plates had been sewn to clothes covering the chest or the thighs, but some had evidently been sewn to headgear. In the Neolithic period the plates were presumably decorative, with no military purpose. David Anthony describes the grave of a child at Mariupol: "he or she (sex is indeterminate in immature skeletons) wore forty-one boar's-tusk plaques, as well as a cap armored with eleven whole boars' tusks, and was profusely ornamented with strings of shell and bone beads."¹⁰⁷ The Mariupol cemetery dates to the fifth millennium BC, and it is very unlikely that the vogue of warriors in Late Helladic Greece wearing boar's-tusk helmets owed anything to the Dnieper-Donets steppe. It is possible, however, that in the Bronze Age such helmets had occasionally been created as impressive headgear in lands where wild boars were hunted. But such possible experiments led to no continuous tradition.

A less costly alternative to the boar's-tusk helmet was eventually produced: the conical bronze helmet. The earliest securely dated bronze helmet from anywhere comes from a warrior grave at Knossos and dates to the LM II period, late in the fifteenth century BC. The bronze helmet was clearly less prestigious than the boar's-tusk helmet: another conical bronze helmet, possibly earlier than the one from Knossos, is decorated with incisions that simulate boar's-tusk plates. This helmet, almost certainly from the Aegean, has only recently been published, and because it was an illicit or a chance find its date is problematic.¹⁰⁸ Although the first conical bronze helmets were evidently made in the Aegean, by the fourteenth century BC they were also prized in other lands newly dominated by a military class. Helmets very similar to the one from Knossos have been found in northern Europe and especially in the Carpathian basin.¹⁰⁹ Most interesting is a helmet that was included in a hoard found in 1847 at the Polish village of Biecz. This village lies near the left bank of the lower Oder, along the German-Polish border and about 90 miles from the Baltic sea, and is not to be confused with the city of Biecz in southeastern Poland. After the Knossos helmet was discovered Hugh Hencken pointed out its striking similarity to the Biecz helmet,¹¹⁰ and it is possible that the Biecz helmet came from the Aegean in exchange for amber. The distribution of the conical helmets, each topped by a spool-shaped knob (to which a plume was very likely attached), is an index of how connected were the Aegean, the Carpathian basin, and the far north of Europe in the middle centuries of the second millennium BC.¹¹¹ In contrast, western Europe seems to have lain outside the militarized area. Of the 120 bronze helmets found in Europe only one has come to light in central or western France and another in the Iberian peninsula.¹¹²

Shields were as important as helmets in the militarizing of the Greek mainland. Here we are dependent on representations, because in Late Helladic Greece shields were made of organic material and have not survived. The "Sea Battle Fresco" from Thera shows each warrior carrying a tower shield: one or more oxhides stretched over a wooden frame, the shield protecting the warrior from his shoulders to his knees. An inlaid dagger from Shaft Grave IV shows two men carrying tower shields and two others carrying the even larger figure-of-eight shields. At *Iliad* 7.220–223 the shield carried by Telamonian Ajax is described as having seven plies of oxhide and an eighth of bronze, a shield so heavy that

only an Ajax could carry it. Both the tower and the figure-of-eight shields would have been far too cumbersome to have been of any use in a chariot.

The earliest shields found in temperate Europe and the British isles are three organic specimens (two wooden and one leather) that were preserved in the moors of Ireland. They have been carbon dated to the middle of the second millennium BC.¹¹³ Bronze shields were not produced anywhere in western Eurasia until ca. 1300 BC, and the eighty-six that have been found have now been published by Marion Uckelmann.¹¹⁴ According to Uckelmann, these bronze shields were typically circular, were hammered from a single metal sheet, usually have a diameter between 50 and 70 cm, usually weighed between 1.5 and 2.5 kg, and were held by a hand-grip in the center of the inner surface. Although the bronze shield became popular in temperate Europe, it did not replace the leather shield in Greece. The early bronze shields (from the Urnfield period) come from the Carpathian basin, southern Germany and a dozen from southern Scandinavia. Somewhat later, from the first millennium BC, are several dozen found in Britain, where they were frequently dedicated and deposited at the edge of wetlands, perhaps as a votive offering to keep the wetland from encroaching on arable soil.¹¹⁵ An *in corpore* bronze shield has yet to be found in western Europe (France and the Iberian peninsula).

Bronze corselets made their appearance in Greece somewhat later than did weapons, boar's-tusk helmets and leather shields. No evidence for corselets has been found in Grave Circles B and A. Although leather or linen corselets may have been worn through most of the LH I period, metal was apparently added by the period's end, when the conquest of Crete took place. In the Near East the chariot crewman wore a tunic to which were sewn hundreds of bronze scales. In Greece corselets were normally plate armor rather than scale armor. A recent study by Marianne Mödlinger has brought together the evidence for bronze corselets in Greece and in temperate Europe.¹¹⁶ The earliest evidence anywhere in Europe comes from Dendra, a few km from Mycenae. Among the grave goods in Grave 8 at Dendra was a piece of bronze armor for the right shoulder, and the burial dates to the LH II period. Slightly later is the complete panoply from Grave 12, dating to the beginning of LH IIIA (ca. 1400 BC). The panoply included greaves and a corselet consisting of fifteen pieces of bronze, which were held together by leather cords and protected the wearer from the neck to the mid-thighs. Series of small holes along the rims show that the bronze plates must have been lined with leather or linen. The corselet is estimated to have weighed at least 15 kg. In 1995 excavations at Thebes discovered fragments of two more corselets, dating ca. 1300 BC.¹¹⁷ These corselets, as best they can be reconstructed, seem to have offered the wearer more flexibility and mobility than did the Dendra corselet. Bronze bands that may have been elements of plate corselets have also been found at Nichoria, Phaistos and Mycenae.

Linear B tablets both at Knossos (the Sc series) and at Pylos (Sh series) are inscribed with ideograms for corselets. The ideograms have occasionally been seen as indicating caparisons for protecting the chariot horses, but Crouwel's comprehensive analysis confirmed the identification with a corselet.¹¹⁸ Because

the Sc tablets were found in the “Room of the Chariot Tablets” at Knossos, and because many of them are inscribed with ideograms for both a corselet and a chariot, it is clear enough that the corselet was worn by someone in the chariot. The Dendra corselet, with its shoulder guards, would have been too constricting for a chariot archer (the Linear B ideograms depict corselets without shoulder guards) but would have protected a chariot driver while permitting him to handle the reins.

The corselets from Mycenaean Greece are earlier than any of the twenty-six found in temperate Europe. Here the earliest are seven from various hoards or river finds in the Carpathian basin, all of which have been dated to the Bz D or Ha A periods (roughly 1200–1000 BC). Next come fourteen corselets found in two votive deposits in eastern France, perhaps dating ca. 1000 BC.¹¹⁹ The vest-like corselets from temperate Europe consisted of a breastplate and a backplate, providing protection from the base of the neck to the waist while allowing free movement of the arms and legs. We may assume that these were worn by men who fought on foot.

It could very well be that Mycenaean chariot crews began wearing bronze corselets in the conquest of Crete. There must have been major battles in eastern Crete ca. 1450 BC, resulting in the destruction of the palaces at Phaistos, Mallia, and Kato Zakro, and of the town at Hagia Triada. In the aftermath the Mycenaeans took control of Crete, and the inhabitants of the island began the long process of Hellenization.

The shipping of horses

This chapter has argued that shortly before 1600 BC a military force arrived in Greece, equipped certainly with chariots, bows and spears, and probably with Type A rapiers. That argument rests on the premise that in the second millennium BC horses and chariots could be carried on ships, in some cases over long distances. Ships are underrepresented in archaeological research, except when George Bass and Cemal Pulak emerged from the waters off Uluburun in southwestern Turkey with sensational cargo from a ship that was wrecked ca. 1300 BC. Although no comparable shipwreck has been discovered from an earlier period, we may assume that ships played as large and vital a role ca. 1600 BC as they did 300 years later.

Important new evidence for ships and ship building during the early second millennium BC has been found at the Red Sea ports of Ayn Sokhna and Mersa Gawasis.¹²⁰ Excavations there “revealed complete and reworked ship timbers as well as thousands of wood fragments. These fragments were created when ancient workers disassembled ships whose shipworm-riddled timbers suggest substantial sea journeys.”¹²¹ Most of the wood is cedar, brought to Egypt from Lebanon and then hauled across the desert to Ayn Sokhna and Mersa Gawasis. Ship building and reassembling began there very early in the second millennium BC. Venturing into experimental archaeology, a team led by Cheryl Ward built—with mortise and tenon joins—a ship based closely on the findings at the Red Sea sites and on Hatshepsut’s temple reliefs portraying the queen’s voyage to Punt. The experimental ship, christened the *Min of the Desert*, is driven by a square sail and a

crew of twenty-four rowers. It is approximately 20 m long, can carry a cargo of 17 tons, and moves at slightly more than 6 knots per hour.¹²² The ship that wrecked off Uluburun must have been somewhat larger than *Min of the Desert*, because the cargo that has survived weighs approximately 20 tons.

We have some evidence for the general importance of ships on the coast of Greece at the beginning of the Mycenaean period. Most obvious are the coastal location of key sites, and the wealth of imported objects buried in early LH tombs.¹²³ Although Egyptian and Levantine imports may well have been brought to Greece by Cretan ships, it appears that Mycenaean ships plied the Mediterranean very soon after the Mycenaean period began.¹²⁴ A few representations hint at the importance of ships for the early Mycenaeans. The Flotilla Frieze fresco at Akrotiri is well known, but not all specialists agree that the ships in the flotilla are Mycenaean. Earlier and less controversial evidence comes from what remains of a tomb (possibly a tholos tomb) at the village of Dramesi, on the coast of Boiotia and usually identified as the Homeric Hyria. Dramesi lies an hour's walk southeast of Aulis, famous as the port from which the ships in Homer's catalogue departed for Troy. A rectangular stone pillar that stood in the Dramesi tomb was incised with crude images of five long ships, each powered by multiple rowers. Although the tomb was plundered, the pottery that the robbers passed over dates the tomb shortly before 1600 BC on the historical chronology.¹²⁵

The pentekonter or the ordinary troop-ship would not have carried horses, and the oversea transport of horses in the second millennium BC must have been an ordeal. Horses are frightened when the surface on which they stand begins to sway or to heave, and in their fear they tend to kick, to bite and to rear. In order to prevent a horse from injuring itself or other horses, each horse on board a ship needs to be closely stalled or boxed in. As a further precaution, the handler might protect a horse's rear legs with wrappings, to prevent it from breaking one of them in a frenzied kick against its stall.¹²⁶

Despite the difficulties, horses in the second millennium BC must often have been transported on ships. Even bringing horses across a river—the Volga, for example, or the Nile—required putting them on a ship. This is a topic on which our information is minimal and scholarly debate has not yet begun. Although Mary Littauer and Joost Crouwel did not discuss the transportation problem they assumed that at the end of the MH period horses and chariots came to Greece by sea, and their assumption must be correct.¹²⁷ The horses at Mitrou, Marathon and the coast of the Argolic bay, as well as those attested in the earliest levels of Troy VI, presumably got there by ship. We must assume that if Attarissiya did indeed have 100 chariots when he encroached upon the Hittite Empire he must have shipped at least 200 horses across the Aegean. Few chariot horses weighed as much as half a ton, and a ship with a cargo capacity of 7 or 8 tons would have been able to carry five or six chariot teams. The several hundred horses available to the Knossos palace in LM III were necessarily brought to Crete by horse-transport, just as were the horses on Late Bronze Age Cyprus. The bringing of horses to Crete was apparently celebrated on a sealstone: at Knossos, in a LM II context, Arthur Evans found a seal impression of a gigantic horse aboard a many-oared ship.¹²⁸

Although the evidence is slim, I think we may conclude that if Neolithic boatmen were able to carry cattle from Anatolia to Crete ca. 7000 BC, mariners ca. 1600 BC were capable of carrying horses across the Black Sea and the Aegean. With a sail assisting the rowers a ship would probably have needed 2 or 3 weeks to sail from the Sea of Azov to the coast of Attika. According to Diodorus Siculus 3.34.7 ships sailing from Lake Maiotis reached Rhodes on the tenth day and Alexandria on the fourteenth, but horse-transports would surely have made more frequent stops at coastal anchorages.

For any information about horse-transports we must go to times much later than the Bronze Age. Julius Caesar does not tell us much about the transports he used when, in one night in early July of 54 BC, he brought 2000 cavalry over the channel from Gaul to Britain. He does say that because the channel waves were seldom high he ordered that the hulls be built lower than normal, and that “in order to transport a large number of animals they were somewhat wider than those we use in other waters.”¹²⁹ What the Roman transports “in other waters” may have looked like remains a question. In the Byzantine period ships called *chelandia* were built to carry horses, apparently between twelve and twenty per ship.¹³⁰ The Byzantine *chelandion* was equipped with a ramp (*klimax*), essential for loading and unloading the animals, and was rowed rather than under sail. The same kind of transport seems to have been used by William, Duke of Normandy, when in late September of 1066 he shipped at least 2000 horses across the English Channel for the battle that eventually was fought at Hastings.¹³¹

The Classical Greek horse-transport—the *hippagogos*—is supposed to have been much larger than the Byzantine *chelandion*. Lionel Casson described the *hippagogos* as rowed by sixty oarsmen and carrying thirty horses.¹³² This is certainly true of transports in the late fifth century BC. Thucydides says (6.43) that in 415 BC the Athenians included in their fleet for Sicily one horse-transport, carrying thirty horses. Thucydides also says (2.56.2), however, that when Perikles in 430 BC sent a fleet around the Peloponnesos and wished to include horsemen in the force, the Athenians “for the first time” (πρῶτον τότε) converted several old triremes to serve as horse-transports. Thucydides’ words imply that after 430 BC horse-transports were often converted from old triremes, but that before 430 BC vessels were always purposely built to carry horses. The purposely built *hippagogos*, like the Byzantine *chelandion*, was probably much smaller than the converted trireme. Specially built horse-transports were certainly in use early in the fifth century BC, when the Persians prepared for expeditions against Greece. Herodotus (6.48.2) says that Darius ordered his coastal subjects to build both warships and horse-transports for the campaign against Athens in 490 BC, and that 10 years later (7.21.2 and 7.97) Xerxes’ fleet included many horse-transports. For what it is worth, Diodorus Siculus (11.3.9), probably following Ephorus, specifies that Xerxes had 850 *hippagogoi*.

The existence of horse-transports in the Late Bronze Age must mostly be inferred, but a few pieces of evidence are available. For New Kingdom Egypt we have a dubious inscriptional reference: a ship named *The Stable*, which Torgny Säve-Söderbergh—in his study of the New Kingdom navy—surmised was a

horse-transport.¹³³ Less dubious is a painting in Paheri's tomb at El Kab, which shows a ship carrying, among other things, a team of horses and—unhitched—a chariot.¹³⁴ Tantalizing pieces of evidence from New Kingdom Egypt are a few texts indicating that armies were transported on ships. When Kamose attacked the *hyksos* kings at Avaris he brought his army—based on chariots—down the Nile on ships.¹³⁵ Hatshepsut claimed to have taken an army down the Red Sea to Punt. And Thutmose III, campaigning in his thirtieth year, went by ship to Syria, where he sacked Kadesh.¹³⁶ Already in the Old Kingdom an Egyptian army—obviously without chariots—occasionally went by ship into the Levant, undoubtedly to avoid the long march through the waterless Sinai.¹³⁷

Finally, some literary evidence assumes the use of horse-transports in the Bronze Age. Homer imagined his Achaean heroes bringing their horses and chariots along to Troy. More pertinent is the Song of Miriam (Exodus 15: 1–18), which dates from the end of the Bronze Age.¹³⁸ The song exults in the drowning of Pharaoh's horses and chariots in the *yam suph*. Later generations in Israel mythicized the song and the event, imagining that Yahweh first miraculously parted the sea so that the Israelites could cross on dry land, and that he then brought the walls of water back down upon 600 Egyptian chariots. The song itself, unlike the prose narrative, has long been seen to refer to a storm at sea, in which one or more Egyptian horse-transports went down.¹³⁹ "Let me sing to Yahweh, for he is highly exalted," sings the poet, "Horse and chariotry he has cast into the sea." "They sank in the depths like a stone," the poet continues, "They sank like a lead weight beneath the dreadful waters."¹⁴⁰

Summary

What, then, can be said about the militarizing of the Greek mainland? Toward the end of the MH period, at about the same time that Troy VI was built, an armed force seems to have arrived on the eastern coast of the Greek mainland, necessarily on ships, and to have taken control of several harbors. Most important seem to have been the harbor at Marathon, accessible from the copper and silver mines at Laurion, and the harbors of Nafplio and Asine on the Argolic gulf. Soon after these takeovers, the intruders apparently took over harbors on the southwestern coast of the Peloponnesos. Among these were Pylos, on the Bay of Navarino, and Peristeria. Both places were probably involved in the importing of amber that was brought south from the Baltic and North Sea to the top of the Adriatic.

The newcomers had horses and chariots, and they carried composite bows. They also had spears with socketed spearheads. Probably they were also girded with Type A rapiers. Whether they brought a triple-riveted Type A with them, or whether they imitated the Type A riveting that the Cretans displayed, they soon devised the less elegant but much more serviceable Type B. They had no metal armor, but probably wore leather corselets and carried leather shields. Whether they also wore boar's-tusk helmets, or whether they learned about the boar's-tusk helmet from their Cretan adversaries, is uncertain. In any case, by the LH I period they had made the boar's-tusk helmet their own.

A conquest such as this must have had a prologue: the intruders, that is, must have known something about the Greek mainland and about the Cretan thalassocracy and its limitations. Perhaps in the earlier phase of the MH III period, as in the latter part of the MH II period, a few chariot crews from the east had been employed by the Cretan rulers of the Aegean. These military professionals would have brought back to their homeland tales about a metal-rich land that was ripe for a takeover.

Because this is prehistory and not history we have no records of any of this. The archaeological evidence, however, is substantial enough to support a theory that this is what happened. I once hazarded the guess that no more than 75,000 people came to Greece at the end of the Middle Helladic period.¹⁴¹ Even that figure now seems much too high. A few thousand military men may have been all that was needed to accomplish the “conquest,” after which they would have sent for their families and dependents.

The militarizing of parts of Greece appears to have been parallel to—and almost simultaneous with—the militarizing of the Carpathian basin, and to have been a precursor of military takeovers in southern Scandinavia and in northern Italy. And in Greece, as in Italy, the linguistic implications of the military takeover are clear enough. The vehicular terms that the military men brought with them—to a land in which wheeled vehicles were still unfamiliar—identify the intruders as speakers of an Indo-European tongue. Over the course of the Late Bronze Age the language of a small military class, greatly influenced by the (probably Anatolian) languages of the large indigenous population, evolved into the Greek that is inscribed on the Linear B tablets.

Notes

- 1 On Dörpfeld’s “Carian theory” see Siapkas 2014.
- 2 Nilsson 1932, pp. 21–22: “Younger archaeologists are prone to throw back the commencement of the Greek immigration to the end of the Early Helladic age or earlier, whilst I find it probable that it began at the end of the following Middle Helladic Age.” See also Nilsson 1927, pp. 11 ff.
- 3 Wyatt 1970. See also Muhly 1979 for a supporting archaeological argument.
- 4 Drews 1988, pp. 160–161.
- 5 On the import of Forsén 1992 see Rutter 2001, p. 115:

In showing that Caskey’s criteria for an invasion of the northeastern Peloponnese, based on his discoveries at Lerna, do not apply at other sites even within the Argolid, much less further afield, Forsén’s study should mark the starting point of a new generation of investigation into the significance of the EH II–III transition.

- 6 Coleman 2000.
- 7 Wyatt 1970, p. 99; Drews 1988, p. 177.
- 8 Crouwel 1981, updated in Crouwel 2004. Already in 1909, when Eugen von Mercklin presented his doctoral dissertation (*Der Rennwagen in Griechenland*), archaeologists must have been dimly aware that they had no evidence for wheeled vehicles in Greece before the Shaft Grave period. The absence of evidence was of no interest in 1909, however, and subsequently it was ignored (even by Wyatt 1970 and Drews 1988).

For very brief statements of the absence of evidence for wheeled vehicles in Greece prior to the Shaft Graves see Childe 1951, p. 193 and Foltiny 1959, p. 56. Crouwel 1981, pp. 147–149, in discussing the probable provenance of the chariots that came to Greece at the beginning of the Mycenaean period, did not deal with the evidence from language.

- 9 Crouwel 1981, pp. 54–56; Crouwel 2004, p. 341.
- 10 Bondár 2012, pp. 72 and 103, counted eighteen clay models from the Baden culture (late 4th to early 3rd millennium BC) in the Carpathian basin, and another eighty-nine from the Early and Middle Bronze Age.
- 11 Penner 1998; Harding 2005; on Mitrou see Maran and Van de Moortel 2014, although the authors attribute the transformation of Mitrou to natives rather than to outsiders.
- 12 Whittaker 2014, p. 208.
- 13 For a review different from mine of the militarizing of Greece see Phialon 2013, a summary of her doctoral dissertation. At p. 32 Phialon discusses bows and arrows (her “6000 points de fleche” should be emended to 600), and in another short paragraph on pp. 34–35 she deals with chariots, but she does not connect chariots or any of the new weapons with a military event.
- 14 Dickinson 2010.
- 15 On the basis of both the archaeological record in Greece and the Hittite texts Jorrit Kelder (see Kelder 2010 and Kelder 2012) has well argued that there was not just a kingdom but in fact a Great Kingdom, ruled by a LUGAL.GAL, in Ahhiya.
- 16 For a translation of paragraph 12 of the Indictment of Madduwatta see Beckman, Bryce and Cline 2011, p. 81.
- 17 Paragraph 36 in the numeration of Beckman, Bryce and Cline 2011.
- 18 See Kelder 2012, p. 43:

The attribution of the title “Great King” (LUGAL.GAL in the texts) to the King of Ahhiyawa is significant. As has been noted above, the title was used by only a handful of Near Eastern rulers; all of whom exercised rule over large swathes of land, including various subservient kingdoms of vassal states. It thus seems logical to suppose that Ahhiyawa—wherever one is inclined to situate it—was organized along the same, Near Eastern, lines. In other words, Ahhiyawa must have included a core-state (a heartland) that was ruled directly by the Great King, and several vassal states.

- 19 Kopanias 2015, pp. 212–215, describes the hostilities between the kings of Ahhiyawa and Hatti over Wilusa and Millawanda in the 13th century BC (reigns of Hattushili III and Tudhaliya IV).
- 20 Lohmann 2010, p. 38, writes that an earlier settlement at Kiapha Thiti was abandoned at the end of the EH II period. “Nach einem Hiatus von mehreren Jahrhunderten erfolgte mit der Errichtung der über 160 m langen Unteren Ringmauer in Mittelhelladisch III der Ausbau der Akropole zu einer mächtigen Burganlage.”
- 21 See Berman 2004. At pp. 16–17 Berman inclines toward the view that Θῆβαι has an Indo-European root, whereas Κάδμεῖοι (the collective ethnonym long antedates the personal Kadmos, and probably also the toponym Kadmeia) clearly has a Semitic root: “easterners.” At p. 19 Berman concludes, “When all the evidence is taken together, it makes some sense to conclude that the ‘Theban’ twin-foundation represents an Indo-European motif that has older roots in central Greece than the archaic-style foundation narrative of Kadmos and the Kadmeians.”
- 22 I refer to the current excavations at Agios Vassilios hill, near the village of Xirokampi in Lakonia. Xirokampi is about 8 miles south of Sparta, and in the eastern foothills of the Taygetos range. Something was built there at the MH/LH transition, and after it was destroyed by fire a small palace was built, which in turn was burned in the 14th century BC, baking a considerable number of Linear B tablets.

- 23 Davis 2010, p. 683:

The first true tholos tomb that survives intact in Messenia is unprepossessing and dates to the final phase of the Middle Helladic period (Lolos 2008). It lies only a few kilometers from the Palace of Nestor, near the village of Koryphasion (formerly Osmanaga). . . .

Koryphasion is at the north end of the Bay of Navarino. Three more tholoi on the Englianos ridge were built in the LH I and II periods. The nearby "Grave Circle" also dates to the LH I period. Of some 130 tholos tombs thus far identified in Greece, almost half are in Messenia.

- 24 Schofield 2007, p. 58.
- 25 Harding and Hughes-Brock 1974, p. 147. At p. 159 the authors state as one of their conclusions that "the spacer-plates from Mycenae, Kakovatos, and Pylos were imported from Britain, probably by sea from Wessex to the west coast of the Peloponnese."
- 26 Harding and Hughes-Brock 1974, Table 1, count more than 100 pieces from Peristeria early in LH II, and more than 500 from Kakovatos in the same period. From later in LH IIB are another fifty-four from the tholos at Routsis-Myrsinochorion, near Pylos. LH I amber finds have been much smaller in Messenia, the Grave Circle at Pylos yielding 8 or 9, and Peristeria one more.
- 27 Harding and Hughes-Brock 1974, p. 152. The reference is to *Emergence of Civilisation*, pp. 467–468.
- 28 Dickinson 1994, pp. 49–50.
- 29 On MH horse bones from Nichoria see Crouwel 1981, p. 33; Drews 1988, p. 82, n. 22; and Dickinson 1994, pp. 49–50. On the bones from EH III Tiryns see Pullen 1992, p. 48.
- 30 Dickinson 1999a, p. 102:

Use of the chariot might not, in any case, have given much advantage to a relatively small group. Like Pyrrhus's use of elephants against the Romans, it might have caused sufficient terror to play a major role in winning one or two battles, but surely opposing warleaders would not be slow to work out ways of dealing with chariots, which can be relatively easily disabled by damaging one of the horses pulling them.

- 31 Korfmann 1998, p. 381, reported on pottery discovered in 1995 in a Troy V level. It was identified by MacGillivray, Betancourt and Wiener as Middle Minoan IIIA.
- 32 Blegen, Caskey and Rawson 1953, p. 10:

One of the most important differences between the Sixth Settlement and its predecessors becomes apparent in an examination of the animal bones that were collected from the habitation deposit: for skeletal remains of horses have been identified among the material from each of the successive strata. Our systematic collection of animal bones, layer by layer, yielded no trace of the horse from the earliest occupation of the site in Troy I to the end of Troy V. The initial stratum of Troy VI, however, produced characteristic bones of horses, and they continued to appear consistently in all the succeeding deposits.

In the horse country of the steppe and South Caucasia people had been raising domestic horses for their meat for millennia, and in the 18th and 17th centuries BC were still doing so. At Jinisi, in Georgia, at least 35 percent of the bones recovered from kitchen middens are horse bones (see Bendukidze 2010).

- 33 See Korfmann 1986. Korfmann's team found a cemetery, poorly preserved, at Beşik Tepe, dating to the Troy VIIa period. These were mostly pithos inhumation burials,

very close to the surface and therefore much disturbed and containing almost no grave goods. The Troy VI cremation cemetery that Blegen found in 1936 is described by Korfmann (p. 26) as “the poorly preserved cemetery south of Troy, which is considered contemporary with the final phase of Trojan Sixth Settlement, Level VIIh. . . . Only nineteen graves identified by urns were excavated, all more or less disturbed.”

34 On this epithet see Bowra 1960, p. 18.

35 See Beckman, Bryce and Cline 2011, p. 81 for the translation of §12 (obv. 60–65) in the Inictment of Madduwatta:

But [later] Attarissiya, the ruler of Ahhiya, came and was plotting to kill you, Madduwatta. But when the father of My Majesty heard, he dispatched Kisnapili, infantry, and chariotry in battle against Attarissiya. And you, Madduwatta, again did not resist Attarissiya, but yielded before him. Then Kisnapili proceeded to rush [. . .] to you from Hatti. Kisnapili went in battle against Attarissiya. 100 [chariots and . . . thousand infantry] of Attarissiya [drew up for battle]. And they fought. One officer of Attarissiya was killed, and one officer of ours, Zidanza, was killed. Then Attarissiya turned [away(?)] from Madduwatta, and he went off to his own land. And they installed Madduwatta in his place once more.

The bracketed “chariots” is restored on the basis of the clear “100.”

36 Maran and Van de Moortel 2014, p. 535.

37 According to Hagel 1992, p. 47, the gate “has an opening of 2.20m.” The early investigation of the site was announced by Catling 1988–1989, p. 20.

38 Dickinson 1994, p. 60, agrees with Pascal Darcque’s argument that Malthi belongs in the LH III rather than toward the end of the MH period. The Malthi Mapping Project, directed by Michael Lindblom, is currently (2016) reassessing the stratigraphic evidence for the site and aims to clarify the dating of the town and the fortification wall.

39 On the team in the Marathon tholos see Crouwel 1981, p. 34. See also Lohmann 2010, p. 42:

Die Publikation der hoch bedeutenden Nekropole von Vranas bei Marathon, die der von Thorikos kaum nachsteht, ist über Vorberichte nicht hinausgediehen. Die Gräber wurden in mittelhelladischer Zeit angelegt und bis in Späthelladisch II hinein belegt. Am Ende der Phase Späthelladisch II bzw. in den Übergang nach Späthelladisch III datiert das berühmte Tholosgrab mit einer Pferdebestattung im Dromos 400m südöstlich der Hügelgräbernekropole von Vranas.

40 Most recently Laffineur 2010, p. 713, refers to “the two earliest tumuli in Vrana-Marathon, tumuli I and II, dated respectively to the Middle Helladic and (early) Late Helladic I periods.”

41 For the problems with Themelis’ reconstruction see Drews 1988, pp. 188–190. See also Hielte-Stravropoulou 2004, p. 19:

Marinatos mentioned that the roofing slabs had fallen down on the horse and broken its spinal cord. That observation, but even more the fact that there does not seem to have been any layer of accumulated earth upon the rock bottom under the horse skeleton is for me an indication that the horse most probably is roughly contemporary with the other burials in Tumulus I, *i.e.* of a clear Middle Helladic date.

42 Protonotariou-Deilaki 1990.

43 See Protonotariou-Deilaki 1990, p. 95, on Tumulus C: “At those places where it had not been disturbed, the tumulus contained MH and earlier sherds. At the point where intrusion had occurred Mycenaean sherds were found.”

- 44 Crouwel 1981, pp. 101–104, with catalogue at p. 158 and drawings in Plates 1–8. In Donder 1980, nos. 1, 2, 3 and 4 are jointed bronze snaffles from Miletos, Mycenae and Thebes.
- 45 Aravantinos 2009, p. 48, with Fig. 13.
- 46 Crouwel 1981, pp. 106–107.
- 47 A. M. Leskov, “Drevnejšie rogovye psalii iz Trachtemirova,” *Sovetskaja Archeologija* 1964, pp. 299–303.
- 48 See Hüttel 1981, pp. 40–48: “Die Scheibenknebel aus Schachtgrab IV von Mykenai.” Littauer was early aware of Leskov’s proposal but rejected it. See Littauer and Crouwel 1973. Subsequent discoveries soon brought Crouwel to a *non liquet*: see Crouwel 1981, pp. 105–106. Piggott 1983, pp. 98–101, noted Littauer’s objections but found Leskov’s arguments persuasive.
- 49 For the fullest description of the Scheibenknebel from Mycenaean Greece and the steppe see now the second chapter (“Die Wangenscheiben,” pp. 23–108) in Penner 1998. For another helpful analysis of the evolution of Scheibenknebel, and the place of the Mycenaean pieces in this evolution, see Kuz’miina 2007, pp. 115–124. In these pages Kuz’miina recaps the analysis she originally published in Russian in 1981.
- 50 Aravantinos 2009, p. 43, with Fig. 3. These were found in the LH IIIB destruction level.
- 51 Feldman and Sauvage 2010, p. 133. For a study of all the stelai, along with excellent drawings, see Younger 1997.
- 52 Younger 1997, p. 232.
- 53 Feldman and Sauvage 2010, pp. 95–96.
- 54 Sauvage suggests (Feldman and Sauvage 2010, pp. 105–106), that at Ugarit chariot kraters may have been mostly in the hands of the *maryannu*. In the house of Urtenu were sherds from six chariot kraters along with various chariot-related artifacts, and in texts Urtenu is associated with horses and chariots.

We previously pointed to similarity in the contexts of the chariot finds at Ugarit and Alalakh; and the Alalakh tablets that show an exclusively royal nomination of the *maryannu* may incline us to think that the interest for the motif was closely associated to a special status conferred by the king, and perhaps experienced as a privilege.

- 55 Drews 2004, pp. 33–36.
- 56 Drews 1988, pp. 163–164; Driessen 1996, p. 485.
- 57 See Abramovitz 1980, p. 58, commenting on the fact that the men in the procession do not wear the typical Minoan loin-cloth but a knee-length chiton:

The short chiton worn by the men is common on mainland frescoes, but does not appear in Minoan art; the kilt (?) worn by one dancer (2) is closest to representations of kilts on inlaid daggers and seals from Mycenae. The fleecy skirts worn by the two women (63) are unusual; the closest parallels occur on a sardonyx seal from Vapheio and on the Haghia Triada sarcophagus.

- 58 Abramovitz 1980, p. 59: “At least six horses, possibly nine, are preserved (Pl. 7). Four of these are standing together in pairs, facing left, a white horse alongside a black one in the traditional method of depicting a two-horse chariot in Aegean art. . . . Fragments 121 and 120 preserve part of a chariot box painted in vivid colors and a chariot wheel. . . . The Keian horses are clearly standing and should be connected with the procession.”
- 59 See Ruppenstein 2010, p. 28 on the *floruit* of Athens in LH IIIA1. On a *synoikismos* see Lohmann 2010, p. 43: by the beginning of LH IIIB all other fortresses and princely burial grounds—Brauron, Kiapha Thiti, Thorikos, Vrana—had been abandoned, and Athens alone was the Herrschaftszentrum.

- 60 Part of the inscription, based on an incomplete transcription of the text, was published by Kitchen 1965. The complete inscription was published by Edel 1966. According to Cline 1994, p. 115, the statue base is no longer available for study, having been destroyed in the late 1970s.
- 61 Drews 2005.
- 62 Kopanias 2015, p. 214.
- 63 Güterbock 1983, p. 134.
- 64 Güterbock 1967 provided a transliteration and translation of the tablet. For his translation of the relevant sentence see p. 77.
- 65 Littauer and Crouwel 1996b, p. 300.
- 66 Driessen 1996, p. 483:

On the basis of the distribution of chariot units in the Mycenaean kingdom of Knossos, Crouwel's taxi-hypothesis will be adapted and changed into a more defensive type of war system, perhaps better called "the wall of bronze". If this hypothesis is correct, it also provides an attractive explanation for the absence of fortifications in specific Mycenaean centres.

See also Driessen's concluding question, at p. 494:

Is it possible that the Mycenaean rulers of Knossos and Pylos depended primarily on the chariot-forces as a deterrent, a static defensive system, whereas their Mainland colleagues put their effort in the erection of fortified citadels, combined with smaller chariot units patrolling the kingdom?

The battle-taxi thesis is required in part because Crouwel and Driessen, like many other Aegeanists, do not believe that the Mycenaean chariot warrior's main offensive weapon was the bow.

- 67 Greenhalgh 1973. Cf. Drews 1988, pp. 165–66.
- 68 Crouwel 1981, p. 127.
- 69 Buchholz 2010, p. 30: "Der epische Kampfwagengebrauch gilt als entscheidender Beweis für die Unwirklichkeit mancher Kampfschilderungen in der Ilias."
- 70 Cotterell 2004, p. 196.
- 71 Shaughnessy 1988, p. 195.
- 72 For a recent argument to that effect see Archer 2010, pp. 58–62.
- 73 See Drews 1988, pp. 157–169, and Drews 1993a, pp. 122–124, on the long tradition of ignoring the LH bow (in large part because very few warriors in the *Iliad* use the bow).
- 74 Driessen 1996, pp. 482–483.
- 75 For the arrowheads see Avila 1983, pp. 83–117, with drawings at Tafeln 23–29. Although for comparative purposes he referred to arrowheads from Crete and the Aegean islands, Avila restricted his project to the bronze arrowheads from the LH mainland. He divided the arrowheads into three basic classes, with fifteen subclasses. Most of the arrowheads are at least 2 cm long but dozens of them are smaller. The entire project required an enormous amount of mostly thankless work. On the *Pfeilspitzenfunde* in Rooms 99 and 100 of the "Nestor Palace" see his p. 86. In his catalogue of Class 1a type arrowheads nos. 193–532 are all from Pylos, with drawings at Tafeln 23 and 24.
- 76 Buchholz 1962.
- 77 In Buchholz 2010, pp. 226–297 deal with *Fernwaffen*. After presenting (pp. 227–234) what is known about slings and sling-stones in LH Greece, on pp. 234–297 Buchholz examined in detail the evidence for *Pfeil und Bogen*. Despite its wealth of information, his 2010 monograph on *Kriegswesen* suffers—as did the first two—from the widely shared assumption that infantry battles were the norm in Mycenaean Greece.
- 78 Ventris and Chadwick 1973, p. 361, refer to "R 0482, on which the ARROW ideogram is followed by the high numbers 6010 and 2630 (which would require about

13 kg. of bronze).” The tablet was found in the “Armoury” at Knossos, not far from “the charred remains of two wooden boxes containing carbonized arrow-shafts and arrowheads.”

- 79 See Ventris and Chadwick 1973, p. 357. This tablet is no. 257 in Ventris and Chadwick’s edition, and Jn09 [+829] in Emmett Bennett’s original designation. In personal correspondence (December 3, 2015) Thomas Palaima informs me that Ventris and Chadwick’s translation of *ka-ko na-wi-jo* as “bronze for ships” should be replaced by “bronze for temples.”
- 80 Palaima 2010, p. 367, using the average 1.5 g weight of the thin arrowheads found at Knossos and other sites, and the 350 g weight for the massive spearheads found in the Shaft Graves.
- 81 Buchholz 2010, p. 234:

Die Herstellung von Bogen kommt bei Homer nicht vor. Die mykenische Palastverwaltung hielt aber dieses Handwerk gemäss seiner Nennung im Archiv von Pylos unter staatlicher Kontrolle. *To-ko-so-wo-ko* wird von den Entzifferern auf *toxō-worgoi*, τὸξοποιοί bezogen. Das zugrunde liegende, wohl altiranische Fremdwort τὸξον war bereits der griechischen Sprache mykenischer Zeit und danach dem frühgriechischen Epos vertraut.”

- 82 Sauzeau 2002. At p. 301, following an argument put forward by Bernard Sergent, Sauzeau suggests that,

le statut de l’arc en tant qu’arme de guerre constitue au sein du monde i.e. [indo-européen] une sorte de ligne de démarcation qui sépare les Celtes, les Germains, les Italiques etc. des Indo-Iraniens. La Grèce—où l’arc de guerre est discrédité—est fondamentalement du côté des Occidentaux, mais, notre dossier la prouve, fonctionne comme une ‘plaque tournante’ entre les deux espaces. D’où l’extrême ambiguïté de l’arc épique.

- 83 On the problems with Lorimer’s argument, and on the conclusions of McLeod 1966 see Drews 1988, pp. 167–170 and especially fn. 59. Georganas 2010, p. 308, has only one sentence on LH bows.
- 84 For a re-dating of two of the Mc tablets from Knossos see Killen 2008.
- 85 For an excellent discussion of the differences between a self bow and a composite bow, with good illustrations, see Cotterell 2004, pp. 58–65.
- 86 On the relation of the Greek to the Indo-Iranian words, and their association with poison, see Sauzeau 2002, pp. 290–292.
- 87 Reboreda Morillo 1996, p. 12.
- 88 Reboreda Morillo 1996, pp. 12–13.
- 89 Molloy 2010, Fig. 19.
- 90 Kasimi-Soutou 1986, pp. 91–94, with Fig. 3.
- 91 See Sandars 1961, Plate 17, no. 2.
- 92 Schofield 2007, pp. 58–59.
- 93 The grave, described as a Shaft Grave, was discovered by Jack Davis and Sharon Stocker on May 18, 2015.
- 94 Although swords have usually been published more quickly than spears in the indispensable *Prähistorische Bronzefunde* series, that has not happened for the Peloponnesos. We have Imma Kilian-Dirlmeier’s catalogue of swords from elsewhere in the Aegean, but her assignment did not include the several hundred swords of the Peloponnesos. Those were to have been catalogued by Yannis Sakellarakis, but Sakellarakis died before completing the catalogue.
- 95 Harrell 2014, pp. 49–50.

- 96 Harrell 2014, p. 6. At p. 4 Harrell says that “a minimum of 36 blades are preserved in Grave V and a minimum of 42 in Grave IV, although early estimates were much higher.” In 1891, she notes, Carl Schuchhardt estimated sixty swords in Grave V.
- 97 Driessen and Macdonald 1984, p. 64.
- 98 Molloy 2010, pp. 404–409 describes the Mycenaean swords, from Type A to Type Gii (Sandars’ basic classification). At pp. 414–422 Molloy, depending on “combat-archaeology methodology,” offers a description of how the various sword types were used in combat. For example, while the earlier swords may have been held with a “hammer grip,” the Type C must have been designed for a “saber grip,” with the index-finger curled around a quillon.
- 99 For the Sesklo spearhead see Avila 1983, no. 4, and for a corresponding schist mold from Sesklo see his no. 5. At p. 6 Avila notes that the find circumstances of a shoed spearhead from Dramesi (no. 2) are unknown, but on the basis of the pottery said to have been associated with it he suggests “*Zeitstellung* MH III—SH II?” For the EH spearhead from Lerna see Branigan 1974, no. 425.
- 100 Avila 1983, nos. 8–21. The Late Bronze Age “shoed” spearheads of Avila’s Type I are nos. 1–7b in his catalogue.
- 101 According to Thomas 2014, p. 375, the many correspondences between Aegean and Near Eastern or Egyptian art and artifacts suggested to Aegeanists that the lion in Mycenaean art and myth was borrowed from Egypt and the Levant. “Most twentieth-century scholars, therefore, concluded that the wild lion did not exist in Bronze Age Greece. The odd tooth or lion bone that surfaced at Helladic sites could be explained as the residue of imported pelts—or pets.” Most importantly, very few lion bones had been found. “This picture has now completely changed. From the 1970s to date, remains of *Panthera leo* have been found at thirteen sites in Greece and twenty-five in southeastern Europe.” See also Thomas 1999 and 2004.
- 102 Georganas 2010, p. 307: “By 1300 BC, the spear had become a much smaller and lighter weapon, with a length of about 2 m and a blade of 20–30 cm.”
- 103 On these ships see Roberts 1991, pp. 56–57.
- 104 Morris 1989, p. 521: “The miniature frescoes may be Minoan in their individual images, but these motifs contribute to a Mycenaean theme, as recognized by numerous scholars.” Mycenaean art, Morris argues, tends to tell a story, while Minoan art does not, and she suggests that in these frescoes we may be looking at “the emergence of Mycenaean art with the participation of Minoan artists.”
- 105 See Tomlinson 1995, p. 37, reporting on continuing excavations at Akrotiri: “Ten sealings depict chariots, bull-games, and heraldic griffins.”
- 106 For a good overview of both *in corpore* remains and artistic representations of Mycenaean boars’-tusk helmets (focusing on the probable painting of such helmets on a papyrus from El Amarna) see Schofield and Parkinson 1994, pp. 164–166.
- 107 Anthony 2007, p. 181.
- 108 This helmet was sold by Christie’s in December of 1998, having been in private hands since 1952, and is certainly authentic. It is described fully in Buchholz, Matthäus and Wiener 2010. That the auctioned helmet is typologically earlier than the Knossos helmet is argued by Mödinger 2013a, p. 401:

Three helmets so far define the development from boar’s- tusk helmets to the oldest European metal helmets: the boar’s-tusk helmet from Dendra with its bronze cheek plates, closely resembling those from the helmet from Knossos; the conical bronze helmet from the unknown find-spot, ornamented with incised or punched boar’s tusk as decoration and with a spool-shaped socket; and, last, the bronze helmet from Knossos with its bronze cheek plates, conical cap profile and spool-shaped socket. Ten further bronze helmets with the same profile and spool-shaped knob are known: they range across to the north-east of central Europe, with a probable distribution centre in the northern Carpathian Bow.

Paradoxically, the helmet from Biecz, chronologically the closest and probably an Aegean export, is the furthest distant from the Aegean. It is likely that this dates to BzC2 (fourteenth century BC).

- 109 See Mödlinger et al. 2013, p. 23:

So far, ten conical helmets are known, another close related find with boar tusk decoration is noted as well. They are distributed from Knossos, Crete in the southeast of Europe to Biecz, Poland, in the northwest. The distribution centre, with the highest number of finds, is the Carpathian basin. The helmets are dated to the 14th–13th century BC; only the helmet from Knossos derives from the middle of the 15th century BC.

- 110 Hugh Hencken, “Beitzsch and Knossos,” *Proceedings of the Prehistoric Society* 18 (1953), pp. 36–46.

- 111 See Mödlinger 2013a, p. 395:

Though the distribution area of conical helmets is rather wide—it ranged from the Havel-Oder region in northern Germany to the Carpathian Basin and the Aegean—the similarity of the helmets as well as the fact that they do not resemble any other type of helmet should indicate a close connection. This belief is also supported by other imported Aegean finds that have turned up in the Havel-Oder region, such as the spearhead from the hoard at Kyhna (Hänsel 2003, 82), as well as the fact that such elaborate sheet metalwork in bronze is scarce in the Nordic Bronze Age work of this period.

- 112 See the map of find-spots at Uckelmann 2011b, p. 250, Fig. 1.

- 113 See Uckelmann 2011b, p. 249, on the earliest European shields:

Vornemlich bestanden diese Schilde aus organischem Material, das sich aber nur selten erhalten hat. Fünf Exemplare sind aus irischen Mooren bekannt: zwei Holzschilde, zwei Schildformer aus Holz und ein Lederschild. Zwei dieser Stücke sind ¹⁴C datiert und ein Ergebnis verweist auf eine schon früh- bis mittelbronzezeitliche Verwendung von Rundschilden im Raum der Britischen Inseln.

- 114 For the catalogue see Uckelmann 2011b. Concise summaries of his findings and conclusions can be found in Uckelmann 2011a and Uckelmann 2012b.

- 115 Uckelmann 2011b, pp. 254–255.

- 116 Mödlinger 2012.

- 117 Eleni Andrikou has described the Theban corselets in detail and explored their significance; see Andrikou 2007.

- 118 Crouwel 1981, pp. 124–127.

- 119 The deposits, each containing seven corselets, were found at Fillinges and Marmesse. The deposits are notoriously difficult to date, but Mödlinger 2012, p. 23, suggests a date for both deposits in the Ha A2 period. For a listing of all thirty bronze corselets from Europe, arranged more or less in chronological order, see Mödlinger 2012, p. 2.

- 120 On all this see Ward 2012.

- 121 Ward 2012, p. 221.

- 122 Ward 2012, p. 224: “The ship measures 20 x 4.89 x 1.7m deep under its beams and displaces 30 tons with a cargo capacity of about 17 tons.” With a crew that included only fourteen rowers instead of twenty-four (many of the rowers were volunteers, and needed more space than experienced rowers need) *Min of the Desert* logged an average of slightly more than 6 knots per hour on its round trip from Safaga to Mersa Alam and back.

- 123 Cline 1994 surveyed the foreign imports, almost 1000 of them, from the entire LH period.

- 124 See Tartaron 2013, p. 22, acknowledging that Crete continued to be an important link between Greece and the Near East and Egypt down to the LH III period:

An entirely different picture emerges for Mycenaean activity in the central Mediterranean (Blake 2008; Mee 2008: 179–81). Already in LH I Mycenaean pottery appears in southern Italy, Sicily and the Aeolian islands. In these areas Minoan influence is minimal, and the Mycenaean presence may reflect a freedom to search for alternative sources of raw materials, probably metals.

- 125 Wachsmann 1998, pp. 143–144, with Figs. 7–30–31. According to Wachsmann, “the tomb dates to the end of the Middle Helladic or the very beginning of the Late Helladic period.” He also notes that several characteristics of the Dramesi ships, as best they can be made out, “may suggest that the prototype for these graffiti was a penteconter.” Although the title of Wachsmann’s book suggests otherwise, most of the content is devoted to the Aegean. His seventh chapter (pp. 123–161) deals entirely with Mycenaean/Achaean ships.
- 126 On the problems in the days of steamships see Hayes 1902.
- 127 Of course I disagree with Littauer and Crouwel about the direction from which horses and chariots came to Greece. When Crouwel wrote his *Chariots and Other Means of Land Transport in Bronze Age Greece* the Sintashta-Petrovka chariots were just beginning to come to light, and Crouwel could say (Crouwel 1981, p. 148), “The chances that chariots reached Greece from further north in Europe are slight. There seems to be no evidence for spoked-wheeled two-wheelers in the north prior to their earliest representation in Greece.” He therefore proposed (pp. 148–149) that horse-drawn chariots were brought first from Syria and the Levant to Crete, and then were brought from Crete to the Greek mainland. The same route was assumed by Littauer and Crouwel 1996b, p. 300.
- 128 The sealing was published by Evans in “The Palace of Knossos and its Dependencies,” *ABSA* 11 (1905), p. 13, Fig. 7.
- 129 *ad multitudinem iumentorum transportandam paulo latiores quam quibus in reliquis utimur maribus* (De bello Gallico 5.1).
- 130 On the transport of horses in the Middle Ages see Pryor 1982. At p. 9 Pryor cites Theophanes’ report that in 762 Constantius V assembled a fleet of 800 *chelandia* for transporting horses, twelve to each ship.
- 131 Bachrach 1985 points out that neither the Vikings nor other northern Europeans had any tradition of transporting large numbers of horses by sea, and he makes a good case that William’s transports were modeled on the Byzantine *chelandia*. The artist of the Bayeux Tapestry had no idea how the horses were brought across the channel.
- 132 Casson 1959, p. 102: The trireme was not only a ship of the line, because “with the oarsmen reduced to sixty it carried horses, thirty to a ship.” See also Casson 1971, p. 93.
- 133 Säve-Söderbergh 1946, p. 42.
- 134 Säve-Söderbergh 1946, p. 3.
- 135 In the First and Second Stele of Kamose at Karnak, supplemented by the Carnarvon Tablet, Kamose describes bringing his force down the river toward Avaris on ships. This is stated clearly by Säve-Söderbergh 1946, pp. 1–2. Less clear is Spalinger 2005, p. 19, after discussing the “Hyksos” bringing chariots to Egypt:

Taking into consideration the new method of warfare, it would appear that the Egyptians used the new technology to defeat the Hyksos. Yet, as we have seen, up through the reign of Kamose the naval contingent remained in the key position of the Egyptian army. By and large, it is assumed that the chariot arm of Kamose was the means by which he defeated the Hyksos, notwithstanding virtual silence by the extant sources on this matter. On the other hand, the need for a fleet was as important as the newly developed chariot division. Both sectors, therefore,

played equal roles in the reconquest of northern Egypt without one taking prominence.

- 136 Säve-Söderbergh 1946, pp. 8–30, reviewed what is known about the expedition to Punt, which in the event did not involve military action. At p. 34 Säve-Söderbergh dealt with the Syrian campaign of Thutmose III, in his thirtieth year:

The campaign of this year (Urk. IV, 689f.), culminating in the plundering of Kadesh, is generally thought to have been the first where ships were used for the transportation of the army—thus perhaps the first great “amphibious operation” in history. Direct evidence is, however, surprisingly scanty. In the Annals this important strategic innovation is only alluded to by the writing of the word *wdj.t* = “expedition, campaign”, here for once with the boat-determinative, thus indicating the manner in which the king proceeded to Syria.

In his footnote, Säve-Söderbergh notes that the same word appears in Amenhotep III’s inscription celebrating his Nubian campaign.

- 137 Säve-Söderbergh 1946, p. 33: “That the Egyptian navy was, occasionally at least, employed in wars in Palestine to avoid the toilsome desert march, we learn through the famous inscription of Uni of the 5th dynasty, where Egyptian troops are said to have been sent to the Palestinian coast in *nmj.w*-ships (Urk. I, 104) to subdue a revolt.”
- 138 Some scholars have dated the song as late as the fourth century BC. Brenner 1991, for example, argued for a post-Exilic date. The consensus, however, remains with Cross and Freedman 1955. Cross and Freedman argued that the poem is early: the alleged Aramaisms and “archaizing” language actually demonstrate that the poem is archaic, dating long before the prose narratives of J and E.
- 139 Cross and Freedman 1955, p. 239: In the Song of Miriam the wind “is the source of a sudden squall which overturns the vessels or barges upon which the Egyptian host had apparently embarked.”
- 140 Exodus 15:1–2, 5 and 10, translation by Cross and Freedman 1955.
- 141 Drews 1988, p. 196.

7 The question of origins

We have good evidence that shortly before 1600 BC military forces took over some of the most valuable parts of the Greek mainland and the Carpathian basin. Where the intruders came from is not yet clear, and may not be until more archaeological evidence is available, but very good work on this topic has been done by Silvia Penner.¹ Her *Schliemanns Schachtgräber und der europäische Nordosten* began as a doctoral dissertation, presented at the Universität des Saarlandes in 1995. The book, published 3 years later, is a model of industry and diligence and is also distinguished by courageous critical thinking. Penner made a strong case that the people buried in the Shaft Graves at Mycenae came from the forest steppe between the Volga and Ural rivers.² She presented in detail striking parallels between burials in the Shaft Graves and those in the Sintashta-Petrovka archaeological culture (and as far to the east as the Bashkortostan border with western Siberia). Penner's work leaves no doubt that the steppe must be at the center of any conversation about the provenance of the people who took over parts of MH Greece.

The same can be said for the military force that took over the most desirable parts of the Carpathian basin. Although she did not develop the argument, Penner also came to that conclusion. The old debate about whether or not the changes in the Carpathian basin came from Mycenaean Greece, she argued, should now be ended: the changes came from the steppe.³ I think that is basically correct, although a few of the innovations may have been imported to the basin by way of Mycenaean Greece, just as a few other changes may have come to Greece by way of the basin. In any case, what happened in Greece and what happened in the Carpathian basin late in the seventeenth century BC appear to have been twin aspects of a single event or series of events.

East or west of the Volga?

On two points I will offer a reconstruction somewhat different from Penner's. First, because of logistical considerations I doubt that the militarizing of either Greece or the Carpathian basin would have proceeded from lands east of the Volga. An expedition starting from the Sintashta-Petrovka communities would have been

required, on reaching the Volga, to have loaded its horses on transports in order to cross the river. And then, after reaching the right bank of the Volga and travelling overland to the Don, would have needed a second set of horse-transports to carry the chariotry down the Don to the Black Sea and to its destination. It is more economical to imagine that a steppe expedition began west of the Volga, along the Don or one of its tributaries.

In arguing that a military force from the Volga-Ural forest steppe came to Greece at the end of the MH period Penner relied on the *Totenritual* performed in both regions (aspects of the construction of the grave, and the selection of grave goods) and on three artifacts that were attested in both places, appearing first in the southern Urals and then in the Shaft Graves at Mycenae. These three artifacts were the organic disk cheekpiece (the *Scheibenknebel*), the wave ornamentation (*Wellenband*) on weapons and other objects, and the forged spearhead with slit socket. In addition, Penner began her argument with a comparison of the gold disks from Grave Circle A and the seven bronze disks found in 1973 in Grave 3 of Kurgan 2 at Novo-Jabalakly, in the Republic of Bashkortostan. This site is far to the northeast of the Caspian, and not far from the southern Urals. The similarities in decoration of the disks are remarkable, especially the curvilinear swastika or the “running S.”⁴

Penner notes, however, that the same design appears on a disk found at Solomenka, in the foothills north of the Caucasus and near the headwaters of the Kuban river.⁵ Solomenka is more than 2000 km southwest of Novo-Jabalakly, and that is a reminder of how dependent our theories are on the vagaries of archaeological finds. It is possible that the “running S” was in vogue even to the west of Solomenka, and it is almost certain that it was in vogue at places in the vast steppe that lay between Novo-Jabalakly and Solomenka. The *Wellenband* decoration on cheekpieces has been found in three places: Greece, the Carpathian basin and the steppe. On the steppe, as Penner shows, as many have been found along the upper Don as along the upper Volga and Ural.⁶

The same is true of the forged, or slit-socketed, spearhead and the *Scheibenknebel*. Although the organic disk cheekpieces that have been found in Greece and the Carpathian basin are paralleled along the southern Urals, they are also paralleled—as Penner shows—along the upper Don and even by specimens found as far to the west as Trakhtemyriv, on the middle Dnieper.⁷ A survey slightly more recent than Penner’s concluded that find-spots of the organic disk cheekpiece are in fact most numerous in the forest steppe between the Volga and the Don.⁸ Penner’s maps also show that forged spearheads have been found not only in the Sintashta-Petrovka region but also at sites on the upper Don, at one on the lower Dnieper, and at one on the left bank of the Kuban. On the diagnostic criteria that Penner uses, the forest steppe between the Don and the Volga has a fairly good claim to have been the starting point for an expedition bent on taking over the mines in the Carpathian basin. The preference for cast rather than forged spearheads in the basin may have been due to the long tradition of bronze casting in central Europe.

The case for southern Caucasia

In a second difference from Penner's reconstruction I will add the likelihood that most of the military men who took over the Laurion mines and other parts of Greece came from southern Caucasia. Without much care and success I argued for that probability in my *Coming of the Greeks*, but the argument has since been strengthened in several quarters and I will devote the rest of this chapter to making the case again. We have striking—although limited—archaeological evidence pointing to a south Caucasian origin for at least much of the force that came ashore

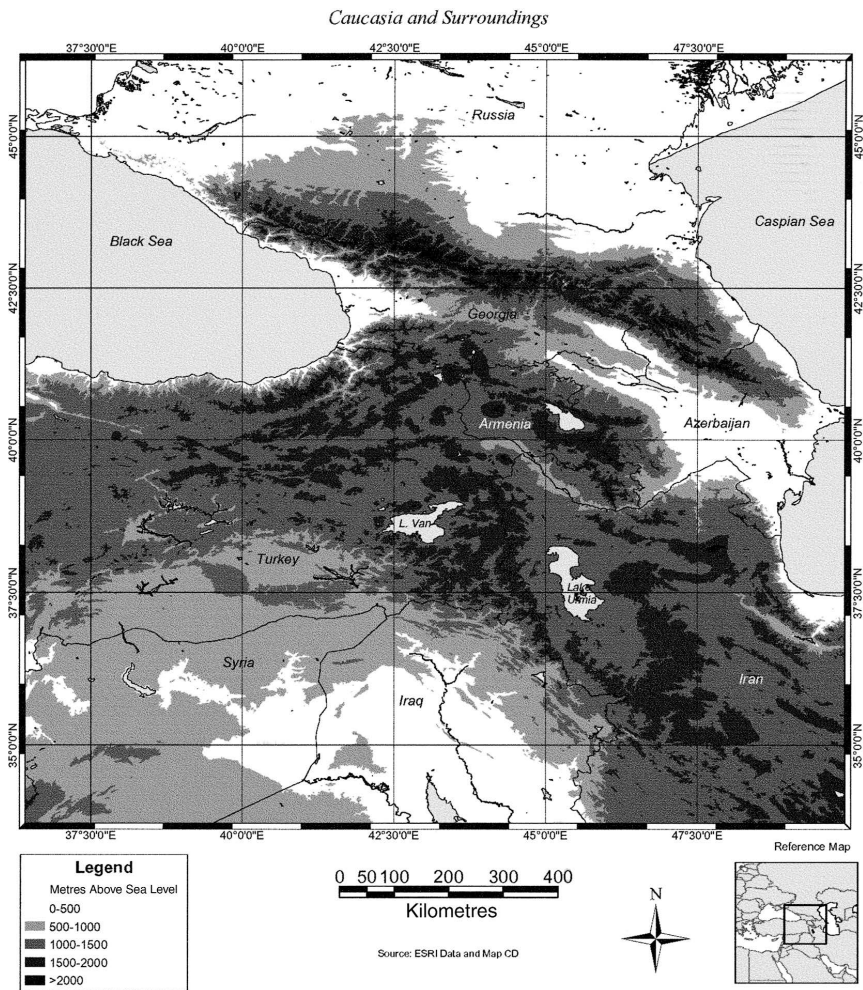


Figure 7.1 Elevation map of southern Caucasia, from Smith 2006, p. 174, Figure 1.
Courtesy Brill Publishers and Adam Smith

in Greece. In addition we have a considerable body of circumstantial evidence, some of it historical and more of it linguistic, pointing in the same direction. The expedition that came to Greece, I believe, was probably launched from the lower Rioni (Phasis) river in Colchis, by men who came from across the Likhi range.

Initially, we must note the limitations of archaeology in southern Caucasia. In comparison to Egypt, the Levant, Turkey, Iraq and Iran, relatively little archaeological work was done in southern Caucasia during the 70 years that followed the First World War. As part of the U.S.S.R. it was not open to western archaeologists, the Soviet authorities did not often prioritize excavators—Boris Kuftin and Boris Piotrovsky were shining exceptions—who wished to work in the southern Caucasian republics, and what was found there was not readily communicated to scholars outside the U.S.S.R. Since 1990 Georgian and Armenian archaeologists have begun to close the gap. As Adam Smith has observed, however, southern Caucasia is still a “marginal” area and is strikingly absent from our histories of the ancient Near East.⁹

The archaeological evidence tying Mycenaean Greece to southern Caucasia comes conspicuously from metalwork: rapiers, spearheads and vessels. Very few bronze swords—and none so early as 1600 BC—have been found on the steppe, and this absence contrasts sharply with the prominence of swords in Mycenaean Greece.¹⁰ In southern Caucasia, as Mikheil Abramishvili has pointed out and as we have seen in Chapter 3, at the very beginning of the second millennium BC (and so before the first swords appeared in the Aegean) the long sword was a mark of status for the men buried under kurgans. Typologically, the southern Caucasian sword closely matched the Cretan sword: both were Type A rapiers, the organic hilt—often covered with gold leaf—precariously attached to the blade with rivets. The rapier connection between southern Caucasia and the Aegean evidently began in the Middle Minoan II period, and suggests that a few chariot crews from southern Caucasia may have been employed by the rulers of Crete. Aegean archaeologists are well aware of significant parallels between the warrior burial at Kolonna, on the island of Aigina, and the burials in the Shaft Graves. The men buried in these graves may well have had a common background and profession.

The metal vessels from southern Caucasia with close resemblance to those from the Aegean are prestige items. Although reckoning with Mycenaean influence in southern Caucasia rather than the other way round, Stefan Hiller pointed out “an impressive, still unpublished silver vessel from Kirovakan in Armenia which represents a kind of over-dimensioned Vapheio cup.”¹¹ Kurgan burials in the Trialeti have produced other parallels to Aegean artifacts. As described by Karen Rubinson,

A group of extremely rich burials under mounds, the burials span a period from about 2000 B.C.E. through about 1450 B.C.E. It is the burials belonging to the last phase, Middle Bronze III, ca. 1600 to ca. 1450 B.C.E. from which the materials with Aegean parallels are found. From Kuftin’s first publication of his excavations, the weapons were considered of “Aegean” type, especially the socketed spear-point from Burial XV.¹²

The Mycenaean parallels to this Trialeti spearhead were found at Prosymna and Ialysos.¹³ It was assumed by Kuftin, and also by later observers, that the southern Caucasian pieces were modeled on Aegean prototypes: that the Aegean could have owed something to southern Caucasia was hardly considered. The Trialeti spearhead, however, is at least a century earlier than its Aegean counterparts.

Kurgan XV in the Trialeti also yielded another striking parallel, which remained unnoticed until observed by Ellen Davis, who in turn brought it to Robinson's attention. A copper cauldron, or kettle, that Kuftin found in the Trialeti kurgan in 1938 is virtually identical to one of the kettles that Schliemann found in Shaft Grave IV at Mycenae.¹⁴ In his study of Aegean bronzework, a study done long before the parallel had been noticed, Hector Catling suggested that the Mycenae kettle must have been made in Crete, noting that the many bronze vessels found in Grave Circle A were completely without precedent on the Greek mainland.¹⁵ In contrast, inclusion of bronze kettles in a burial was not uncommon in southern Caucasia.¹⁶ It therefore appears that southern Caucasia is a better candidate than Crete for the Shaft Grave kettle in question. As Robinson describes the two kettles,

the copper cauldron from Mycenae is the same shape as the Trialeti example, and the same size, with a diameter of approximately 56 cm. The example from Mycenae, like the Trialeti specimen, has an extra piece of copper folded over the rim and riveted on, and handles split, with leaf-shaped ends, attached to the inside and outside of the cauldron.¹⁷

Kurgan XV in Trialeti is one of the Middle Bronze III group, for which Robinson originally suggested a date between 1600 and 1450 BC.¹⁸ There is some circularity here, because the date for the kurgan rests in part on the copper kettle's virtual identity to the one from Shaft Grave IV, but carbon dating has raised all of the Trialeti dates. According to the ArAGATS team, "[r]adiocarbon dates . . . suggest that the Middle Bronze III period should be dated from the eighteenth/seventeenth centuries to the last quarter of the sixteenth century B.C."¹⁹ Mikheil Abramishvili dates Kurgan XV no later than the middle of the eighteenth century BC.²⁰ On the historical chronology used here I will assume a date in the seventeenth century BC, in any case much earlier than the burials in Shaft Grave IV.

Another important correspondence between southern Caucasia and the Aegean is the representation of two men in a chariot, pursuing a deer. That scene, as is well known, appears on a gold ring from Shaft Grave IV. Less well known is that the same scene, rendered in a bronze model, was a favorite in southern Caucasia. There the bronze model served—as Stuart Piggott noted—as a yoke ornament for an actual chariot.²¹ Three such models were found at Lchashen, and a fourth has been found at Lori Berd, both sites in Armenia. The kurgans under which they were found are usually dated ca. 1400 BC.²² When Piggott wrote his book only poor photographs of the models were available, but Maria Pogrebova published fine drawings of each of the four.²³

The workmanship on the gold ring from Shaft Grave IV is far superior to that of the southern Caucasian models, probably because the princes at Mycenae were

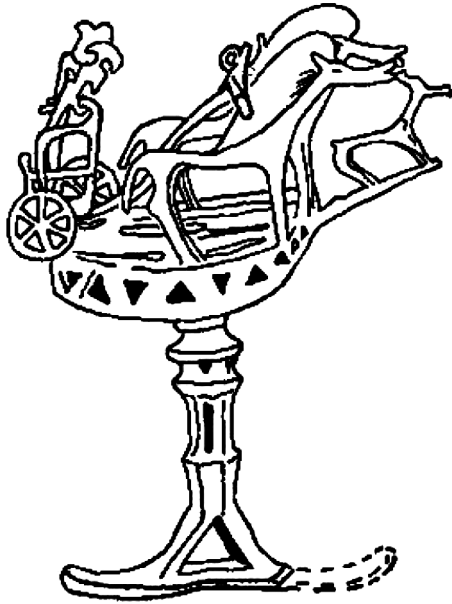


Figure 7.2 Bronze chariot ornament found at Lori Berd, in Armenia. From Pogrebova 2003, Figure 3. Courtesy John Wiley & Sons, and Blackwell Publishing Ltd

able to employ expert Cretan craftsmen. Not particularly relevant to my argument, but of some antiquarian interest, is that still in the Late Bronze Age southern Caucasian metalworkers perfected a method of hollow casting, which allowed them to produce a “chariot rattle”: a hollow figurine enclosing a few loose bronze pellets.²⁴ As the horses ran, the figurine affixed to the chariot pole must have rattled like the bells on the harness straps of sleigh horses.

Penner’s three diagnostic artifacts are not entirely lacking in southern Caucasia (and the *Totenritual* there also had parallels to Mycenaean Greece). Although *Wellenband* decoration was not common in southern Caucasia, it was not unknown: on a pot found in Kurgan 12 at Verin Naver, dating to the Middle Bronze Age, the main register is covered with a *Wellenband*.²⁵ It must nevertheless be conceded that the prominence of the *Wellenband* in Mycenaean Greece is unlikely to have been due to newcomers from southern Caucasia. A much more likely explanation for that prominence would be extensive Mycenaean contact with the Carpathian basin, where the motif was wildly popular.

As we have seen, the forged bronze spearhead, or the spearhead with a slit sleeve, is well attested in Middle Bronze contexts in southern Caucasia. Some specimens from that region have an even closer resemblance to Aegean spearheads than do any of those from the Sintashta culture: the Trialeti spearhead with close Mycenaean counterparts at Ialysos and Prosymna has been noted above. Penner’s

map shows two sites in southern Caucasia where slit-socketed spearheads have been found. One of these is Gostibé, on the Kura river in Georgia, and the other is Khodja-Daoud-Keupru in Azerbaijan, where the de Morgans also found one of the very early Type A rapiers that they brought back to France.²⁶ Those two are far from the only sites in southern Caucasia where forged spearheads have been found. According to Kushnareva,

Bronze spearheads are common in burials of the Trialeti culture. They are the earliest socketed spearheads in the Transcaucasus. In each of the Trialeti, Meskheti, and Kirovakan kurgans an example of a socketed spearhead was found. The spearheads did not differ from each other. At Nuli and Kvasatali socketed spearheads and darheads were encountered in large quantities. Here together with elegant ceremonial weapons the tombs contained crude spearheads with a slit socket (Figure 39). Archaic socketed spearheads are known from chance finds at Boshuri near Gori and in the assemblages from Azna-Byurd and Arich.²⁷

Kushnareva lists three other sites that have yielded “ceremonial” spearheads very similar to those from Shaft Grave IV at Mycenae.²⁸

Advent of the tamed horse in southern Caucasia

What is entirely lacking in the material record for southern Caucasia is the *Scheibenknebel*, along with any other *in corpore* evidence for chariotry or the tamed horse before ca. 1500 BC. That is the date that Hakob Simonyan assigns to the kurgan burial that he has recently uncovered at Verin Naver, a burial said to have been accompanied by a chariot to which had been attached a quiver holding sixty barbed arrows.²⁹ It must be said, however, that study of the tamed horse in the southern Caucasian Bronze Age is in its infancy, although beginnings have been made—separately—by Maria Pogrebova and Irine Sultanishvili.³⁰ Others have concluded that from the beginning of the third millennium BC (and possibly already in the fourth) domesticated horses were raised as food animals in the region, and that late in the third millennium BC their numbers increased and horses were typically slaughtered at a kurgan funeral there.³¹ The rescue excavations at Jinisi, in Georgia, found that horse bones account for at least 35 percent of the bones deposited in levels dating to the eighteenth and seventeenth century BC.³²

Although domesticated horses were apparently common in southern Caucasia during the Middle Bronze Age, the question remains when these domesticated horses were first tamed, which is to say broken either for riding or to the yoke for use in draft. Pogrebova and Sultanishvili, who did not discuss the prevalence of horses as food animals in southern Caucasia’s Early and Middle Bronze Age, dated the first use of tamed horses to the region’s Late Bronze Age, or after 1500 BC. Stressing the similarities of the region’s chariots and harnessing to those of the Near East, and accepting Littauer’s argument that bits and chariots were pioneered

in the Near East, they concluded that southern Caucasians learned about chariotry from Near Easterners.³³ This conclusion is difficult to square with the mounting evidence that both the bit and the chariot were invented in the forest steppe, and that metal bits were a Near Eastern improvement both on the Near East's own nose-rings and on the organic bits of the steppe.³⁴ In 2008 Sultanishvili reported that the earliest bits found in southern Caucasia are jointed bronze snaffles from the Georgian villages of Berikldeebi and Sasireti, dating to the fourteenth century BC.³⁵ Five years later Simonyan reported finding in kurgan N1 at Nerkin Naver a jointed snaffle bit made of iron dating from late in the third millennium BC.³⁶ If that dating is correct, southern Caucasia was shockingly precocious in the taming of horses. For various reasons, as I indicated in Chapter 3, I suspect that the iron bit may have been an Iron Age intrusion in a Middle Bronze Age kurgan. On the other hand, it is difficult to believe that bits were not used in southern Caucasia until the fifteenth century BC. If in fact the Berikldeebi and Sasireti jointed snaffles were the first bits to be used in southern Caucasia the region was shockingly slow to tame its horses. By that time horses had long been pulling chariots almost everywhere else from India to the North Sea. It will not be surprising if future excavations in southern Caucasia find organic cheekpieces that preceded the use of bronze bits.

For despite questions about the archaeological evidence we have good reason to believe that southern Caucasians must have been familiar with tamed horses already by 2000 BC and with chariot warfare by the eighteenth century BC. As we have seen in Chapter 2, horses were first imported into Mesopotamia shortly before 2000 BC. It is not known whence these horses came, but the word for "horse"—ANŠE.KUR.RA, "ass from the mountains"—gives us as good an answer as we are likely to find. This Sumerogram, used in various languages all through the Middle and Late Bronze Age, first appears in texts of the Ur III period. It has sometimes been thought that the mountains in question were the central and southern Zagros, but that is not likely. Until well into the second millennium BC domesticated horses were exotic animals in the Zagros and the Iranian plateau, and the few that are attested there between 2000 and 1500 BC must have been brought in from horse country.³⁷ Easily the closest such country was southern Caucasia. In the eighteenth century BC the only certain emporium for tamed horses in the Near East was the Anatolian city of Harsamna (or Charsamna), located somewhere to the north of Kanesh and probably in eastern Hatti.

The first horses brought to Mesopotamia were meant to be ridden, and were controlled by a nose-ring and a stick. By the nineteenth century BC a few tamed horses in paired draft were being brought into central Anatolia. A cylinder seal shows that horses and chariots were known in Kanesh in the nineteenth century BC, the horses being controlled again by nose-rings. It may be that the taming of horses for riding, the horse being controlled by a nose-ring, began in southern Caucasia late in the third millennium BC. If that is what happened, we must also suppose that early in the second millennium the southern Caucasians learned, from their contact with the steppe, first about spoke-wheeled carts and then about bits.

Akkadian texts show that ca. 1800 BC the palace at Chagar Bazar, in north-eastern Syria, owned twenty chariot horses and employed grooms for them. In the middle of the eighteenth century BC Anitta of Kanesh had forty teams of chariot horses in his siege of Šalatiwara. Again, it is not known where these chariots and chariot horses were coming from, but suspicion attaches to southern Cauca—sia. Also pertinent is the chariotry of the Great Kings of Hatti. In the 1640s BC Hattushili I did battle against the chariots of Abbaya in his campaign against Sanahuitta, and both cities seem to have been located to the northeast of Hattusha. Hattushili had chariots of his own, evidently hundreds of them. Because it is difficult to see how he could have acquired his horses and chariots—as well as men who knew how to manage them—from the north, the south or the west, the odds are fairly good that he got them from the east. The employment of *Manda* chariot crews by both Hittite kings and their adversaries in the seventeenth century BC points also, although vaguely, in the general direction of southern Caucasia (wherever *Manda* was, it almost certainly lay to the east of Hattushili's kingdom).³⁸

The linguistic evidence

Less vaguely, Akkadian and Hittite texts show that chariots and chariot warriors appeared early in Hurrian-speaking lands to the north of Mesopotamia, and indicate that the Hurrian speakers who lived there had learned about chariots from people who spoke Proto-Aryan, or Indo-Iranian. The Great Kingdom of Mittani, established in the sixteenth century BC, stretched from the upper Euphrates to points east of the upper Tigris (probably including Nuzi). Although most people in Mittani (and at Nuzi) spoke Hurrian, as evidently did some people who lived on the northern side of the Bitlis-Zagros mountains, the dynasty that established the Great Kingdom came from a Proto-Aryan community and was in the forefront of chariot warfare. Hurrian speakers adopted Proto-Aryan words for various exercises in the training of chariot horses, as shown by the Kikkuli text, and also for the classification of horses, as shown by texts from Nuzi.³⁹ That the Proto-Aryan speakers as well as the Hurrian speakers used their chariots in warfare is indicated by the term *maryannu*. The Proto-Aryan speakers in question presumably lived beyond, but not very far beyond, the Hurrian speakers.

Indo-Europeanists have for a long time believed that the language most closely related to Greek is Armenian (this despite the fact that by 400 CE, when Mesrop Mashtots devised the Armenian alphabet and began a translation of the Bible into his vernacular, Greek and Armenian were already farther apart than were English and Italian in Chaucer's day). The close relationship of Greek and Armenian was proposed almost 100 years ago, was presented in detail by James Clackson, and has most recently been supported by Hrach Martirosyan.⁴⁰ Recent cladistic analyses, so far as I understand them, confirm the linguists' conclusions about a special relationship between Greek and Armenian.⁴¹

Indo-Europeanists are also quite certain that in a wider subgroup Greek and Armenian stand close to Indo-Iranian. Clackson in fact concluded that the links

between Indo-Iranian and Greek are as strong as those between Armenian and Greek.⁴² Because the Indo-Iranian, Greek and Armenian languages have a genetic relationship, and because Indo-Iranian was fully fledged by ca. 1500 BC, we must suppose that the roots of Greek and Armenian go back to a much earlier stage of Indo-Iranian.

Relics of the wider subgroup have been found in poetic language. Calvert Watkins found “sharp-winged eagle” in similes in Homeric Greek and Vedic Sanskrit, and also in one of the few scraps of Armenian oral poetry that survived long enough to be quoted in writing.⁴³ Most famously, as Indo-Europeanists have known since Adalbert Kuhn pointed it out in 1853, the formula “imperishable fame” was inherited both by Homeric Greek (κλέος ἄφθιτον) and by Vedic Sanskrit (*śrávas . . . ákṣitam*).⁴⁴ The formula was especially meaningful for a warrior who died young, and at *Iliad* 9.413 Achilles recalls how Thetis once told him that he would need to choose between a long life and imperishable fame. According to Watkins, that choice is “perhaps the central Indo-European theme.”⁴⁵ Because the people who brought the proto-Greek language into Greece also brought with them the idea of “imperishable fame,” we must here observe once again that militarism—or a warrior tradition—seems to have come to the Greek mainland along with what was to become the Greek language. That this could have happened in the third millennium BC, many centuries before the first weapons of war made an appearance in Greece, is difficult to imagine.

Still another language that once belonged to the subgroup in question is Phrygian, which died out more than 1500 years ago (no Phrygian version of the Bible was ever attempted) and is known only from several hundred inscriptions, most of them funerary and very short. As summarized by Shane Hawkins in his review of the Iron Age languages of Asia Minor, “*Phrygian* is an Indo-European language and shares a few distinguishing features with Greek, Armenian and Indo-Iranian. It is not well understood, but several elements of the grammar have been worked out.”⁴⁶ The kinship of Phrygian and Armenian was noticed by the Classical Greeks. Eudoxos of Knidos (ca. 370 BC) wrote in his *Ges periodos* that the Phrygian and Armenian languages had much in common.⁴⁷ Although Classical Greeks did not notice Phrygian’s close kinship to their own language, it has not escaped the notice of philologists despite the narrow range of the Phrygian language available for study.⁴⁸ Phrygian’s relationship to Greek can best be explained, I believe, as a result of the divergence of a single language on the two sides of the Aegean, leading to Greek on the European side and to Phrygian in the Troad.

Where did people speak a language that was descended from an early stage of Indo-Iranian and that was ancestral to Greek, Armenian and Phrygian? Because in the second quarter of the second millennium BC people who spoke Indo-Iranian evidently lived not far from Hurrian speakers, and because cuneiform texts locate Hurrian speakers in and around Mittani (probably extending to some communities north of the Bitlis-Zagros mountains) a plausible locale for the wider subgroup would be southern Caucasia. There are good arguments in favor of locating the Indo-Iranian homeland in the Andronovo, the Sintashta-Petrovka, or the BMAC

culture, but the only evidence we have for Proto-Aryan (or Indo-Iranian) comes from the upper Tigris and upper Euphrates. Whether the Kurdish language is a relic of this Bronze Age presence of Indo-Iranian is unknown. The *Kardouchoi* whom Xenophon and the Ten Thousand met in the forbidding mountains south of the Kentrites river (the Botan), have often been identified with the Kurdish language. That guess may be correct, although the identification rests entirely on a similarity of the Kurdish and Karduchian names. The earliest Kurdish literature—a Yazidi religious text—dates only from the thirteenth century.

The whereabouts of Proto-Armenian point more precisely in the direction of southern Caucasia. We have no reason to think that Armenian was ever spoken anywhere other than in the land that Darius, in the Old Persian version of his Behistun inscription, called *armina* (the Akkadian version of the inscription refers to the land as *urashtu*, a Babylonian variant of the Assyrian *urartu*). In the inscription Darius recounts at some length his suppression (in 521 BC) of a rebellion against him in *armina*.⁴⁹ Although the inhabitants called their county *hayk*, that name never gained currency anywhere else. From the Persians the Greeks borrowed the exonym *armina*, and called the country Ἀρμενία.

The Persian Army List in Herodotos (7.73) has the Armenians and Phrygians brigaded together, under the command of Artochmes, and identifies the Armenians as *apoikoi* of the Phrygians. That, however, is an aetiological tag: the ethnographer responsible for the list felt an obligation to explain where each of the various *ethnē* he mentioned had come from.⁵⁰ Unlike Herodotos and his source, the ancient Armenians seem to have had no knowledge of their ancestors' migration from Phrygia. According to the *History of Armenia* said to have been written by Movses Khorenatsi in the fifth century (and actually written by Pseudo-Movses Khorenatsi in the eighth), the Armenian nation was established by the eponymous Hayk the Forefather, who led his 300 followers to Armenia from the half-finished Tower of Babel.⁵¹ More important than this Christian invention is that Pseudo-Movses said nothing about a migration from Phrygia, having never read Herodotos or any other Classical Greek historian (Pseudo-Movses' "Greek sources" were lifted from the Armenian translation of Eusebius' *Chronicle*). What Pseudo-Movses did write about were dozens of Armenian patriarchs and kings, with whose fantastic feats (such as their wars against Semiramis and Sardanapalos) he filled the huge gap between Hayk the Forefather and Alexander the Great. The aetiology at Herodotos 7.73 that the Armenians were *apoikoi* of the Phrygians did not come from the Armenians and was very likely a deduction from the similarities of the Armenian and Phrygian languages.

Discussions of Armenian origins have been bedeviled by what historians, following the Akkadian usage, call the kingdom of Urartu. From Tushpa, the capital on the eastern shore of Lake Van, the "Urartian" kings dominated much of southern Caucasia from the middle of the ninth to the beginning of the sixth centuries BC. This kingdom represented a sharp break in southern Caucasian pre-history, because in the centuries preceding the establishment of "Urartu" we have no evidence for a kingdom or even for substantial settlements in the region. Ca. 850 BC, and probably inspired by the Assyrian revival under Ashurnasirpal II,

a Great Kingdom appeared in the land of Mt. Ararat. The “Urartian” kings fought often with the Assyrian kings, and ultimately and disastrously with the Skythian and Median warlords.

Unusual clarity on “Urartu” is available from Paul Zimansky, an expert on the kingdom and its written documents. Zimansky prefers, first of all, not to call the kingdom Urartu, but to use the name that its rulers used: Biainili. Assyrian kings, on the other hand, consistently referred to it only as the kingdom of the *māt urartu*, which in our terms meant “land of (Mt.) Ararat.”⁵² Some sixty royal inscriptions, some thirty clay tablets, and several hundred ownership or dedicatory inscriptions on bronze artifacts, are written (in cuneiform script) in the “Urartian” language, which was a cognate (and not a descendant) of Hurrian. Zimansky believes that in Biainili the knowledge of the “Urartian” language was limited to the palace and to other government functionaries, because evidence for the language ends after the palace was destroyed and the kingdom abolished by Median (or Skythian) marauders early in the sixth century BC.⁵³ The kings had their pronouncements inscribed in the “Urartian” language either because that was the language of the ruling family, or because there was no scribal tradition in the vernacular of Biainili while cuneiform scribes had been writing in a Hurrian-Urartian language for over 1000 years.

The vernacular in the Great Kingdom of Biainili was quite certainly Armenian. The Armenian language was obviously the region’s vernacular in the fifth century BC, when Persian commanders and Greek writers paired it with Phrygian. That it was brought into the region between the early sixth and the early fifth century BC, and that it immediately obliterated whatever else had been spoken there, can hardly be supposed. Looking for words from the Hurrian language family that made their way into Armenian, John Greppin found only sixteen: eight from Hurrian and eight from “Urartian.” He concluded that although the Armenian language had been contiguous to the Hurrian family it could not have been a superstrate over a language from that family.⁵⁴ Because Proto-Armenian speakers seem to have lived not far from Hurrian speakers our conclusion must be that the Armenian language of Mesrop Mashtots was descended from an Indo-European language that had been spoken in southern Caucasia in the Bronze Age.

Overall, we have good reason to locate in southern Caucasia an early form of Indo-Iranian that over many centuries gave rise to Armenian, Greek and Phrygian. If in the middle of the third millennium BC Indo-Iranian pastoralists began filtering into southern Caucasia, the roots of the subgroup may have been planted. I will speculate that by the seventeenth century BC what we know as Indo-Iranian may have been spoken to the south of some natural frontiers, while to the north people spoke a cognate from which would evolve Armenian, Phrygian and Greek. One such frontier may have been the Araxes river, the middle and lower courses of which served as the border between the Russian and Persian empires after 1813. Another frontier may have been the Botan/Kentrites tributary of the upper Tigris. In his long march Xenophon found (*Anabasis* 4.3.1) that the Kentrites, two plethra wide, separated the land of the Kardouchoi from Armenia.

Conclusions

However obscure, the linguistic relationships discussed above lead to the conclusion that shortly before 1600 BC the most valuable parts of Greece and the Carpathian basin were taken over by military forces that came from two widely separated regions in the east. Although in both regions an Indo-European language must have been spoken, it would not have been the same Indo-European language. Greek and Phrygian evolved from an Indo-European subgroup that includes Armenian and that apparently had Indo-Iranian roots. The language that was brought to the Carpathian basin, and that seems to have evolved into Keltic, Italic and Germanic, did not belong to that subgroup. The *Wellenband* decoration and the *Scheibenknebel* brought to the Carpathian basin suggest that the expedition that took over the best parts of the basin originated in the steppe, probably between the Don and the Volga. The expedition that took over the Troad and the most desirable coasts of Greece is more likely to have come from southern Caucasia.

Because the new rulers in Greece seem initially to have exchanged goods and styles with the new rulers in the Carpathian basin, we must suppose that at that time at least a few people knew both of the Indo-European languages in question. Both of those languages must soon have changed significantly, however, because both in Greece and in the Carpathian basin the military class must have been vastly outnumbered by the indigenous population. By 1400 BC the two ruling groups were going very separate ways. Those in Greece had come into the fringe of the civilized world, where the Cretan palaces provided a model of political organization, of literacy, and of extensive trade with the Near East. In contrast, the military class in the Carpathian basin controlled a land rich in natural resources but far away from palaces or states of any kind. As a result, while a Mycenaean civilization formed and flourished, apparently including even a Great Kingdom, nothing comparable would appear in the Carpathian basin for the next millennium and a half.⁵⁵

The Greek terminology for the parts of a wheeled vehicle, along with the absence of earlier evidence for wheeled vehicles in Greece, makes it quite certain that the military takeover ca. 1600 BC brought to Greece an Indo-European language that in its new setting would become Greek. Because military events of the same kind and at the same time seem to have happened in the Carpathian basin we can propose—here the argument depends on parallels with Greece—that an Indo-European language also came to the basin at that time. A hundred years later chariots seem to have come from the Hungarian plain to northern Italy, and to have brought with them the vehicular terms that would eventually make their appearance in the Latin language. At about the same time a military force from the Carpathians arrived in southern Scandinavia, possibly leading to the evolution there of the Germanic subgroup of Indo-European. If that is what happened, we would be left with the probability that Keltic evolved *in situ* from the language brought to the Carpathian basin ca. 1600 BC. The linguistic possibilities and impossibilities are far beyond my ability to see, and I must hope that an Indo-Europeanist will explore them. What is fairly clear is that in the middle centuries

of the second millennium BC four parts of Europe were suddenly militarized by men who had, among other things, horse-drawn chariots.

Notes

- 1 For a balanced evaluation of her work see Harding 2005.
- 2 See her summary statement at Penner 1998, pp. 211–212, on a movement “ausgehend vom Gebiet zwischen oberer Wolga und Ural.”
- 3 Penner 1998, pp. 213 and 215.
- 4 At Penner 1998 see pp. 13–22, with Abb. 2, nos. 1–3 from Novo-Jabalakly, and Abb. 3, nos. 1 and 4–10, from the Shaft Graves.
- 5 Penner 1998, p. 15, with Abb. 5.2.
- 6 Penner 1998, Tafel 38, with her remarks at p. 123: “Mit den Verzierungen auf den Scheibenknebeln von Starojur’evo, Kondraškinskij, Pičaev und Sarata-Monteoru ist die Wellen- und Schlingbandornamentik schon in der Pokrovsk-Früstufe der Abašev-Kultur belegt.” The first three sites mentioned lie along the upper Don and its tributaries.
- 7 Penner 1998, maps at Tafeln 15–17. In Hüttel 1981 the Trakhtemyriv *Scheibenknebel* are nos. 14 and 15.
- 8 See Priakhin and Besedin 1999, p. 40:

As this article was being prepared, we had information on over sixty finds or fragments of disk-shaped cheekpieces with spikes from twenty-nine monuments in Eastern Europe (see Fig. 1). Most are situated in the Don-Volga forest-steppe and adjacent regions beyond the left bank of the Volga. Relative concentration is not a reflection of the extent to which various regions have been studied by archaeologists. On the contrary, the greatest number of finds has been obtained from the relatively poorly researched regions of the northern Don-Volga forest-steppe.

- 9 See Smith 2005, p. 231,

Unfortunately, at present the Caucasus is only faintly inscribed in the archaeological traditions of Europe and the U.S. The tensions of the Cold War certainly contributed to the marginalization of the region within the archaeology of the ancient Near East as it developed in the years after World War II.

Smith goes on to say that “. . . the southern Caucasus is entirely absent from almost all major Western synthetic discussions of the ancient Near East.”

- 10 Hand-to-hand weapons in the Late Bronze Age steppe were spears and socketed axes. See Kohl 2007, p. 170 and his Fig. 4.24. Archaeologists have long been aware of the paucity of swords in steppe burials. See Childe 1942, p. 134: “Western forms that affected methods of fighting or costume never caught on; of the types so characteristic of the Late Bronze Age in Central Europe I know only two or three stray swords, all from West of the Dnieper.” Professors Carola Metzner-Nebelsick and Anthony Harding kindly inform me (personal correspondence, July 2, 2016) that subsequent finds of bronze swords east of the Carpathians have been very few. In the invaluable *Prähistorische Bronzefunde* series 18 volumes are devoted to swords, but none of them deals with swords east of the Carpathians.
- 11 Hiller 1991, p. 213.
- 12 Rubinson 1991, p. 284.
- 13 See Hiller 1991, p. 213, having noted the similarity of Type A rapiers in southern Caucasia and Mycenaean Greece:

The same can be attested to some extraordinary spear heads with angular shoulders and a fine ridged midrib; they correspond to Aegean specimens of group G in O. Höckmann’s classification system (cf. Plate LVII, b). As M. Gimbutas has seen

many years ago there is a close relationship with two spear heads from Prosymna. But, as to my knowledge, no list assembling the existing specimens has been published and no closer analysis has been made. Judging merely from drawings the Trialeti pieces might be taken to be true imports.

- For the Prosymna spearheads see Avila 1983, nos. 75 and 76.
- 14 The “virtual identity of the two objects” was observed by Rubinson 1977, pp. 246–247. For illustration of the Mycenaean kettle see Catling 1964, Fig. 18, no. 5. For the Trialeti kettle see Abramishvili 2010, p. 170, Fig. 2.8; and Kushnareva 1997, p. 96, Fig. 37, no. 15.
 - 15 Catling 1964, p. 187, conceded that “metal vessels in Crete are extremely rare before the end of MM III,” but pointed out that at the transition from MM III to LM I “quite a wide repertory of forms was in circulation,” suggesting that Cretan metalworkers had mastered the techniques of manufacturing such things. That was not the case in MH Greece: “The earlier history of metal-working in Greece is not such as to suggest that our vessels could have originated there; their origin must be sought in Crete.”
 - 16 In personal correspondence (March 21 and 22, 2016) about the Kurgan XV kettle Karen Rubinson writes that this kettle is unique in southern Caucasia, but also notes that “there are a lot of cauldrons in burials in the South Caucasus generally, so certainly it could have had a SC origin.”
 - 17 Rubinson 1991, p. 284. See also Abramishvili 2010, p. 173.
 - 18 Rubinson 1977, p. 247, but the author informs me that now she would probably date Kurgan XV no later than ca. 1700 BC.
 - 19 Badalyan, Avetisyan and Smith 2009, p. 68.
 - 20 Abramishvili 2010, p. 170, at Fig. 2.8 puts the date of Kurgan XV “ca. first quarter of 2nd mill. BC.” See also Badalyan, Avetisyan and Smith 2009, p. 56.
 - 21 Piggott 1983, pp. 96–97; for an *in situ* specimen see Pogrebova 2003, p. 397–398: In a grave at Lchashen “a bronze model was found at the juncture of the pole and the yoke.”
 - 22 Pogrebova 2003, p. 397.
 - 23 For a description and illustration of the models see Pogrebova 2003, pp. 398–400, with Figs. 2 and 3.
 - 24 Gomelauri 2008, pp. 365–366:

These rattles functioned as standards fastened to chariots, and are found in great variety in graves of the Lchashen-Tsitolgori culture where funerary rites involving chariots are attested. Nearly identical figurines are found throughout geographically distant regions, such as Berikldeebi and Atsarat, Tsitolgori and Mezamor, Sasireti and Artik. This suggests a centralized manufacturing centre supplying a widespread “tribal” aristocracy.

- 25 See Smith 2005, p. 263, Fig. 7.
- 26 See the map at Penner 1998, Tafel 60.
- 27 Kushnareva 1997, p. 110.
- 28 See Kushnareva 1997, p. 215: “Ceremonial spearheads found at Trialeti, Kirovakan, Meskheti, and Boshuri, have direct analogues in Syria at Ras Shamra I, at Mycenae in Shaft Grave IV, and in Troy IV (*sic*), where they date to 1700–1500 B.C.” For illustrations see her Fig. 39, nos. 3, 4, 7 and 8, all from MB cemeteries in Georgia. See also Hiller 1991, pp. 212–213 with Plate LXVII b.
- 29 See Simonyan 2012.
- 30 Pogrebova 2003 and Sultanishvili 2008. Bendukidze 2010 deals mostly with onagers.
- 31 Manaseryan and Mirzoyan 2013, pp. 136–137:

Horse: *Equus caballus*. When making the description and interpretation of horse bone remains, it is necessary to indicate first that they go back to the end of the

5th and middle of the 4th millennium BC. The first evidence of domestic Horse remains quite possible comes from Aratashen. Because the wild horse is completely missing in the large bone material from the neighboring Chalcolithic and Early Bronze Age, we consider these bones as coming from domestic horses. Whether they really belong to the domestic horse, still needs to be checked by C14 dating. Of nearly the same age are the oldest horse bones from Shengavit, Sepasar and Aparan found there in Early Bronze Age sites. Horse bone remains were found in large quantities in the Early and Middle Bronze Age settlement and burials (N. Manaseryan, L. Mirzoyan 2000, pp. 87–107).

On the slaughter at kurgan funerals see Simonyan and Manaseryan 2013.

32 Bendukidze 2010, p. 267.

33 As seen by Pogrebova 2003, pp. 399–400, “[i]t is well known that the chariots whose models were found in south Caucasian cemeteries belong to the type widespread in the Near East, to be precise, to its Syro-Palestinian or Hittite variety.”

34 Sultanishvili 2008, p. 379, does not mention the priority of organic bits:

The earliest bits have been discovered in Western Asia—at Ras-Shamra, Gaza, Tel el-Amarna, and Luristan (Fig. 2). All these date to 1700–1500 BC. According to shape, straight-bar bits, bits with circular cheek-pieces from Palestine and Luristan seem to be the earliest.

See also Pogrebova 2003, p. 397:

The first traces of the use of chariots, i.e. light horse-drawn vehicles with two spoked wheels (Littauer and Crouwel 1979, 71; Nefedkin 2001, 61–2), in Transcaucasia (Fig. 1) can be dated to the beginning of the Late Bronze Age, i.e. to the late fifteenth- early fourteenth-centuries BC, since rich barrows of this period yielded bronze chariot models. It is worth noting that at the same sites remains of genuine wooden vehicles with either four solid or two spoked wheels have been encountered.

35 Sultanishvili 2008, Fig. 3.

36 Simonyan and Manaseryan 2013, p. 187, with Fig. 13.

37 On this topic see now Potts 2014, pp. 48–53, “Advent of Horse Husbandry in Iran.” Onagers were ubiquitous in Iran all through the Holocene. Horses, in contrast, had been at home in Iran during the Pleistocene but virtually disappeared at the end of the Pleistocene. Potts finds only six sites at which horse bones are attested between 10,000 BC and the end of the 2nd millennium BC. Two sites from the Iranian plateau yielded a few horse bones, evidently of wild horses, from the 5th and 4th millennia BC. Potts then lists four sites with horse bones ca. 2000 BC and later, and none of the four is on the Iranian plateau. At pp. 52–53 Potts observes that skulls of evidently domesticated horses have been found at Godin Tepe, in Luristan, dating ca. 2100–1800 BC, and at Tell Farukhabad at the same time, in an Elamite context. Finding very little osteological evidence for *Equus caballus* until late in the 2nd millennium BC, Potts ties the beginning of intense horse husbandry to “the coming of the Iranians,” and he suggests that the Iranians may have come from southern Caucasia at that time. On horse bones see his summary at p. 53: “The quantity of caballine-like equid remains recorded in pre-Iron Age Iran is minuscule in comparison with that of hemiones, making it difficult to avoid the conclusion that the earliest horses in Iran were imported isolates.”

38 On the *umman-manda* see now Adalı 2011. After Adalı’s survey went to press another possible reference to *umman-manda* was published. This stands in an inscription set up by Sin-iddinam, who ruled over Larsa from 1849 to 1843 BC on the middle Mesopotamian chronology. See Volk 2011 for the entire inscription. The possible reference to *umman-manda* occurs at Column III, lines 54–55. Volk did not originally read it there, but in a *Nachtrag* on pp. 87–88 he inclines toward revising his text, now

preferring to translate the lines as “Ehemals hatte ich die *ummān-mandu* -Truppen mit der Waffe zurückgeschlagen.” If the revised reading is correct, this would be by far the earliest known reference to Manda-troops.

- 39 Raulwing 2009, p. 7, reports that Wolfram von Soden “was able to identify hippological Indo-Aryan terms in the archive of Nuzi (the modern Jorgan Tepe near Kirkuk in Iraq) which indicate colour or age of horses.”
- 40 See Martirosyan 2013. A Greek-Armenian subgroup was first proposed in 1924 and 1925 by Holger Pedersen and Antoine Meillet. For a brief *Forschungsbericht* on the relationship of Greek to Armenian see Clackson 1994, pp. 28–29.
- 41 See Rexová, Frynta and Zrzavy 2003, pp. 122–123: after performing three analyses, the authors state that “all results indicate . . . that Armenian and Greek languages are close to one another (however, they may form a paraphyletic assemblage).” See also Ringe, Warnow and Taylor 2002, pp. 102–103.
- 42 See Clackson 1994, pp. 201–202:

However, the morphological evidence which suggests that Greek and Armenian stem from neighboring Proto-Indo-European dialect areas connects them as closely to the Indo-Iranian languages, and we have also discussed in Chapter 4 a number of possible lexical agreements between the three language groups, which might augment the list of lexical agreements between the languages presented by Porzig and others. Scholars have also observed the close relationship between the morphological systems of Greek and Indo-Iranian, and a few exclusive agreements, between Armenian and Indo-Iranian especially, in vocabulary. These various factors all support the reconstruction of a dialectal group of the parent language comprising the speech forms which later developed to give the Armenian, Greek and Indo-Iranian languages, as has recently been argued by K. H. Schmidt and others. In my opinion there is not sufficient evidence to suppose any closer link between Greek and Armenian than between either language and Indo-Iranian, and the reconstruction of a Greek-Armenian-Indo-Iranian dialect area is sufficient to account for these agreements.

- 43 Watkins 1995, pp. 170–171, developing an argument briefly suggested by Karl Schmidt, concluded that “sharp-winged eagle” should be regarded as “a probable inheritance from the common poetic language of Indo-Iranian, Greek, and Armenian.” Because “Indo-Iranian, Greek and Armenian constitute a dialect area on independent grounds (augment, prohibitive negation, stem formation of denominative verbs),” Watkins sees the parallel noun-and-adjective epithets “as an inheritance from the poetic proto-language of the same dialect area.”
- 44 Watkins 1995, Chapter 15: “An Indo-European theme and formula: Imperishable fame,” pp. 173–178, provides a full study of this formula.
- 45 Watkins 1995, p. 176 (the italics are his).
- 46 Hawkins 2010, p. 215. Some 300 inscriptions in Paleo-Phrygian have been found (only two have more than a few words), dating from the 8th to the middle of the 5th century BC, and another hundred in Neo-Phrygian from the 1st and 2nd centuries CE.
- 47 See Steph. Byz. 437,

Armenia. A land near the Persians’ land. It is named after Armenos, a Rhodian, as Antipatros says in the third book of his *On the Rhodians*. The inhabitants are called Armenians, as Eudoxos says in the first book of his *Description of the Earth*: “The Armenians are a *genos* from Phrygia, and in their speech they Phrygicize a lot (πολλά φρυγίζουσι).” . . . Also, Armenia is a feminine gender (adjective) in Xenophon.

- 48 For several examples of the relationship of Phrygian to Greek see Lubotsky 1988. Kortlandt 1990, p. 4, agrees with Lubotsky that “Phrygian was rather closely related

- to Greek.” According to Martirosyan 2013, p. 85, an analysis of shared lexical innovations indicates “that Armenian, Greek, (Phrygian) and Indo-Iranian were dialectally close to each other.”
- 49 Col. 2, 7–11 (Tolman trans.)
- 50 If one believes in national migrations and takes one’s prehistory from Herodotos one will discover that the Medians got their name from Medea and the Persians theirs from Perses, son of Perseus and Andromeda. One will also learn that the Phoenicians migrated from the Red Sea (whence they got their name), the Etruscans from Lydia, the Phrygians from Macedon, and the Hellenes from Phthia, where they lived in the time of Deukalion, to numerous stopovers until they reached the Peloponnesos. The Persian Army List that Herodotos gives us (7.61–99) probably was constructed by Hellanikos. See Drews 1973, pp. 28–29. On the supposed Etruscan migration from Lydia see Drews 1992, and on the Phrygian migration from Macedon see Drews 1993b.
- 51 Movses Khorenatsi 1.9. For the English translation of this text see Moses Khorenats’i, *History of the Armenians* (Cambridge, Mass.: Harvard University Press, 1978. Translation and commentary by Robert W. Thomson). In Book 1 Pseudo-Movses quotes extensively from the “old book” that he claims was found in the archives of Niveveh and that detailed the origins of the Armenians. When building the Tower of Babylon, a fearful wind brought the confusion of languages and stopped the men from their building. “One of these [men] was Hayk, descended from Yapetost’ē, the renowned and valiant prince, strong and accurate in drawing the bow.”
- 52 Zimansky 2011, pp. 548–549: “The Bible and Neo-Hittite documents followed the Assyrian lead, the Biblical Ararat simply being a rendering of Urartu transposed by writers who were no longer familiar with the original pronunciation.”
- 53 Zimansky 2011, p. 557: “Urartian literacy was strongly tied to the government of Biainili, and was otherwise probably quite superficial.”
- 54 See the observations at Greppin 1991, p. 722:
- It is certain, though, that the Armenians cannot be a people who resulted from an Indo-European overlay upon a Hurro-Urartian people. Were this true, we would find considerably more Hurro-Urartian linguistic detritus in Armenian, not only lexical material, but remnants of their syntax and perhaps phonology. Hurro-Urartian, an ergative language with great agglutinative powers, is considerably different from Armenian, and there have been no claims that its syntax left scars on the Armenian language, such as Old French did on English.
- 55 On the comparative regression in the Carpathian basin see Metzner-Nebelsick 2013, pp. 342–348: “Das Problem des Endes der Tell-Siedlungen.” The tell-settlements in the basin faded gradually and by the 15th century BC were either gone or considerably diminished. One reason, Metzner-Nebelsick suggests, was over-exploitation of the metal resources, but she also notes that the rulers in the basin—unlike their counterparts in the Greek mainland—failed to adopt institutions and practices essential for centralized societies.

Appendix

The chronological quandary

In this book I have employed an historical chronology, based on written records, rather than the ^{14}C chronology favored by most archaeologists, especially those working in temperate Europe. As is well known, the carbon chronology is about a century higher (earlier) than the historical chronology. For temperate Europe carbon dates are all that we have, and otherwise the chronology for the Bronze Age in temperate Europe is heavily dependent on parallels with the Aegean. I am not at all certain that the historical chronology is correct, but although it has problems of its own it is conventional and relatively stable.¹ For the Aegean, the historical chronology is based ultimately on synchronisms provided by Egyptian artifacts—often a scarab bearing a royal cartouche—found together with Mycenaean pottery. The ^{14}C chronology may be correct but is not yet conventional, and is subject to change as more carbon tests are done, and as calibration curves are revised.

The starting point for the historical chronology of the second millennium BC must be in the Near East, and specifically in Egypt's Amarna period. Assyrian and Egyptian king-lists agree that Akhenaton's reign falls in the middle of the fourteenth century BC. Egyptologists date it either 1352–1334 or 1350–1332 BC. Assyriologists, on the basis of *limmu*-lists and the three copies of the Assyrian king-list, date the 35-year reign of Ashur-uballit I either 1353–1318 BC (short) or 1365–1330 BC (long). The Amarna tablets show that Akhenaton was a contemporary not only of Ashur-uballit I at Assur but also of Burnaburiash II at Babylon, of Suppiluliuma II in Hatti, and of Tushratta in Mittani. In addition, the considerable quantity of Mycenaean pottery found at Amarna shows that when Akhenaton ruled Egypt the ceramic industry in Mycenaean Greece was producing and decorating LH III A2 ware.²

From the Amarna period and Akhenaton the Egyptian king-lists carry us back—almost, but not quite, as securely—to Ahmose and the beginning of the Eighteenth Dynasty. Most Egyptologists date the 25-year reign of Ahmose to 1550–1525 BC, although Egyptologists who prefer a low chronology would date it to 1539–1514 BC.³ A recent analysis of carbon-14 results puts the commencement of Ahmose's reign somewhere between 1570 and 1544 BC, and therefore slightly earlier than the king-lists' high chronology.⁴ Beyond Ahmose lies the Fifteenth ("Hyksos") Dynasty and the rest of the poorly known Second Intermediate Period of Egyptian

history. The Fifteenth Dynasty has usually been dated ca. 1650–1550 BC, but recent finds point to an earlier date for its commencement.

In Mesopotamia, absolute dates for the first half of the second millennium BC depend on king-lists and on the Venus-tablet from the reign of Ammisaduqa, the penultimate king of the First Dynasty of Babylon. The tablet records the heliacal risings of the planet Venus over a 21-year period, allowing modern astronomers to fix the reign of Ammisaduqa and all the other kings of the First Dynasty against the planet's 64-year cycle. Which of the possible cycles is the correct one, however, is debated: a high, a middle and a low chronology are all possible, one following another in 64-year intervals. The middle chronology, which I am following, places Hammurabi's 42-year reign in Babylon at 1792–1750 BC. The low chronology, placing it at 1728–1686 BC, no longer has many champions among cuneiform scholars. A dendro date for Shamshi-Adad I, who was an older contemporary of Hammurabi, supports the middle chronology.⁵

Real trouble begins when we try to date the volcanic eruption on Thera. The pottery in use on Thera when the volcano erupted was Late Minoan IA, which Aegean archaeologists have traditionally dated to the second half of the sixteenth century BC, contemporary with the early kings of Egypt's Eighteenth Dynasty. The dreadful storms described by Ahmose in his "Tempest Stela" may have been consequences of the Thera eruption, and if they were the eruption occurred early in Ahmose's reign or just before it.⁶ That can be accommodated by the traditional ceramic chronology. But the carbon dates, and especially the carbon date for an olive tree that was evidently buried alive by the eruption, point consistently to the late seventeenth century BC, 100 years earlier than LM IA pottery has usually been dated.⁷ Making things still more difficult, Manfred Bietak reports that his excavations at Avaris show that Thera pumice fell on the city *after* the city had been sacked by Ahmose and in fact after its rebuilding had begun by one of Ahmose's successors. Most Egyptologists will not permit Ahmose (to say nothing of a sizeable part of the Eighteenth Dynasty) to be retrojected to the seventeenth century BC: the Egyptologists simply do not have enough pharaohs to bridge the gap between so early a date and the Amarna period.

So we have a stand-off between those scholars who trust physics and those who trust historical records and stratigraphy, although I suspect that few scholars in either group would bet a year's salary on their choice. The journal *Antiquity* recently presented a debate about the date of the Thera eruption.⁸ The advocates of a high date were evenly matched with advocates of a low date. Skeptical about the carbon dates, Alexander MacGillivray decided that the best course for the Aegean archaeologist was to ignore them:

Physicists will continue to argue the "high" date because it fits their methodology. Archaeologists will continue to support the low date because it fits theirs. Neither camp needs the other's approval to carry on with their research, which is fortunate, because agreement appears to be a long, long way off.⁹

Not wishing to wait for agreement, concession or compromise, I have used the traditional historical chronology. I must acknowledge, however, that the dates here given (1600 and 1500 BC appear regularly) could be 100 years too low. Only time will tell.

Notes

- 1 The historical chronology, especially for the period with which this book deals, is more fluid on the Mesopotamian than on the Egyptian side. See Schwartz 2008, p. 450:

In the case of absolute chronology, we are relatively confident in addressing the last four centuries of the second millennium B.C. This period is well dated because the record of a solar eclipse in 763 B.C. is anchored to a list of Assyrian eponyms. . . . The lists of eponyms and kings kept by the Assyrians and Babylonians allow us to date events back from the first millennium B.C. to the fourteenth century B.C. . . . By contrast, establishing an absolute chronology for the period before the fourteenth century B.C. has been a frustrating process marked by controversy and disagreement.

- 2 On the dates for LH IIIA2 pottery see Wiener 2003. Wiener puts the transition from A1 to A2 between 1390 and 1375 BC, and the transition from A2 to B1 between 1330 and 1290 BC.
- 3 For the 1550–1525 BC date see pp. 207 and 484 in Shaw 2003.
- 4 See Ramsey et al. 2010: “Our radiocarbon data indicate that the New Kingdom started between 1570 and 1544 B.C.E.”
- 5 See Schwartz 2008, pp. 451–452:

Excavations of the Sankaya palace at Acemhöyük in central Anatolia revealed clay seal impressions associated with the northern Mesopotamian king Shamshi-Adad I, presumably removed from goods sent from his realm. Dendrochronological analysis of wood beams from the palace yielded a date of 1774 $\pm$ 4/–7 B.C., suggesting that Shamshi-Adad died sometime after that date—unless the sealings had been moved from an earlier building.

- 6 Dealt with most recently by Ritner and Moeller 2014. Their article is a response to Wiener and Allen 1998. Egyptologist Ritner, *contra* Allen, is quite certain that the stela does refer to a natural disaster. See especially his translation at p. 6. Archaeologist Moeller then dates the Thera eruption, and therefore also Ahmose’s reign, to the late 17th century BC.
- 7 On the olive branch see Friedrich et al. 2006, p. 548. The branch was the only preserved part of a tree (the rest of which was perceptible in the tephra) that had been buried alive by the eruption. Previously published carbon dates from Thera came from seeds or other short-lived organic materials. In the same issue of *Science*, Manning et al. 2006 accordingly add 100 years to the traditional chronology for LM I, now dating the beginning of IA shortly before 1700 BC and ending it at 1600 BC, and stretching LM IB from ca. 1600 to ca. 1450 BC. Their LM II remains short and in its usual place: 1450 to 1400 BC.
- 8 “Bronze Age Catastrophe and Modern Controversy: Dating the Santorini Eruption,” *Antiquity* 88 (2014), pp. 267–291. This is a “debate” feature with a variety of views expressed, by either individuals or teams. Four of the contributions (including a substantial piece by ^{14}C specialists) argue that a date in the late 17th century BC is too high.
- 9 MacGillivray, in *Antiquity* 2014, p. 289.

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